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CRIMES OF LOVE AND HATE

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BY H. ASHTON-WOLFE

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says of himself: 'While a pupil and assistant of Dr. Bertillon in Paris, I found the study of criminology so absorbing, so exciting, and so full of opportunities for encountering the weird and fantastic, that I threw myself heart and soul into the work. My knowledge of languages and familiarity with most of Europe's great cities caused me to be chosen very often when investigations were necessary in other countries. Since the war, however, I have ceased to be exclusively engaged in criminal investigation abroad, but my profession as interpreter has brought me constantly in touch with the great investigation centers of the world and I have frequently become intimate with some of the most interesting criminals of modern times.'

Books by H. Ashton-Wolfe

THE FORGOTTEN CLUE
CRIMES OF VIOLENCE AND REVENGE
CRIMES OF LOVE AND HATE ✓

The Forgotten Clue

by

Ashton-Wolfe

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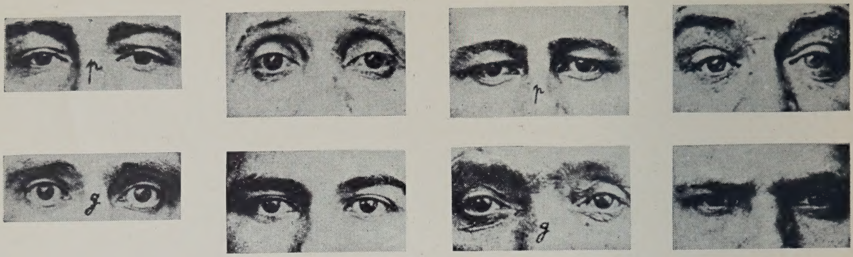

Fig. I. Types of eyes and eyebrows

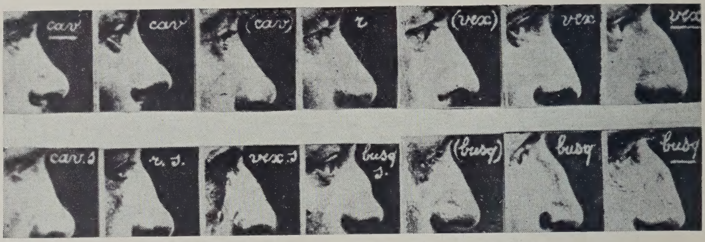
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Fig. II. Noses as classified by the police

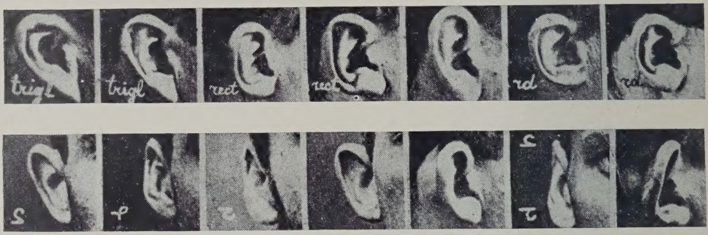
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Fig. III. Some of the infinite varieties of ears

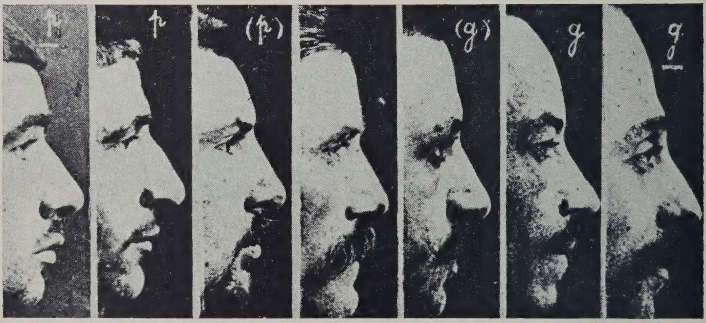

Fig. IV. A few typical profiles

THE DIVERSITY OF FEATURES AS CLASSIFIED BY BERTILLON

THE FORGOTTEN CLUE

Stories of the Parisian Sûreté
With an Account of its Methods

BY

H. ASHTON-WOLFE

WITH ILLUSTRATIONS

PRÉFECTURE DE POLICE

Boston and New York
HOUGHTON MIFFLIN COMPANY
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1930

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TO

DR. EDMOND LOCARD
I DEDICATE THIS BOOK
IN
SINCERE FRIENDSHIP

PREFACE

MANY of the scientific methods described in this book, the official photographs illustrating them, and also the *dossiers* from which the various cases have been taken, were placed at my disposal by Dr. Edmond Locard, chief of the Lyons laboratories. It is the least I can do, therefore, to dedicate this book to that eminent scientist and to express publicly my sincere gratitude for his generous assistance. Dr. Locard, under whose sole responsibility are more than a million criminal charts, and the *dossiers* in which details of the crimes and their clever detection are set forth, has continued and elaborated the work so ably initiated by my former teacher, the great Alphonse Bertillon. He alone of the French experts is not only a chemist, but a doctor, a psychologist, and a specialist on forgeries. The records of crimes committed on French soil are collected and classified in Paris, but all crimes committed in the Rhone Department are investigated by Dr. Locard, whose laboratories at Lyons contain the most up-to-date instruments, many of which are of his invention. He, too, was the first to utilize many of the methods evolved by Sir Arthur Conan Doyle and attributed to the legendary Sherlock Holmes. That is because Dr. Locard is not only a scientist, but a poet with the poet's imagination. I also desire to make my acknowledgments to M. R. A. Reiss, the great criminologist of Lausanne, who for many years instructed detectives, sent to him from every land, in those precise methods of scientific crime-detection which are superseding all former systems.

H. ASHTON-WOLFE

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THE FORGOTTEN CLUE

THE FORGOTTEN CLUE

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CHAPTER I

THE DETECTIVE OF FICTION AND THE DETECTIVE IN REAL LIFE

Curiously enough, most writers of detective stories have manifested a decided preference for what has been termed analysis and deduction, and the immediate popularity of Sherlock Holmes was due chiefly to his extraordinary ability to reconstruct a crime from insignificant details. Yet it was this very quality which awakened the hostility of the real-life investigators. Methods of crime detection are useless if they are individual — that is, if they repose upon personal ability alone. The more mechanical and impersonal the science of investigation becomes, the more easily is it imparted to each unit of the great army of detectives. When a crime has been reported, it must be investigated immediately, before the scent grows stale; therefore every detective must possess the knowledge necessary for the work quite apart from his personal talent. That is why, among the countless methods invented by writers for discovering who committed a crime, only those which can be taught to every officer have been adopted by the police. In this respect Émile Gaboriau, who wrote his stories at a time when detection was in its infancy, may be considered a pioneer. Truly his heroes, Lecoq and Tabaret, are endowed with exceptional *flair*, but they also proceed methodically and almost scientifically. The four best stories Gaboriau published, which were assiduously studied by detectives, are: 'L'Affaire Lerouge,' 'Monsieur Lecoq,' 'Dossier 113,' and 'Le Crime d'Orcival.'

In the first book M. Lecoq is quite a novice, but he is ambitious and determined to succeed. His opportunity comes when he and several colleagues arrive at a miserable tavern, on the outskirts of Paris, just as several shots are fired by someone inside. The police force their way into the place, and are confronted by a man dressed as a labourer, who threatens them with a pistol. Lecoq enters through a back door and takes him by surprise. At Lecoq's unexpected appearance, the fellow with the revolver exclaims: 'The Prussians! I am lost!' This cryptic remark is the starting-point of Lecoq's investigation.

What should a mere labourer know of the words Napoleon used at Waterloo, when, instead of Grouchy, Blücher arrived and made defeat certain? Three men are lying on the sanded tavern floor. Two have been shot and are dead; the third has a fractured skull and dies without giving the police any useful information. Lecoq's chief is of the opinion that the whole affair is nothing but the outcome of a quarrel among ruffians. He arrests the murderer and, leaving Lecoq in charge, returns to headquarters. The young detective at once sets to work. His belief that the murderer is an educated man is strengthened by the fact that, instead of escaping before the police broke down the door, he remained to face them, probably because he covered the retreat of someone whose safety was dearer to him than his own. This, Lecoq reasons, would only be a woman. Fortunately it had snowed, and at the back of the tavern Lecoq discovers the footprints of two women, who ran across the garden towards a timber-yard, where, judging from the marks he left, a man joined them. Lecoq describes this man as tall, athletic, dressed in black woollen garments, and wearing a cap. He believes him to be married, about forty years old, and devoted to the man who was arrested. He explains to a colleague how he arrived at these conclusions. The footprints in the snow reveal the fact that the man approached the rear of the tavern *after* the shots were fired, because his boots have obliterated the women's footprints in several places. Only an exceptionally cool and daring man would have risked this, and only if he were determined to help his friend at all costs. One of the women had tripped and fallen headlong, and the unknown had carried her some distance and placed her on a heap of planks, from which the detective concluded that he was athletic. His clothes and cap have left traces and shreds of wool on a rough plank, from which he wiped the snow, and he had rested his elbow on another heap of boards, four feet high, which proves that he was tall. The man also left the imprint of his hand in the snow, and the mark of a plain ring on the third finger suggests to Lecoq that the fellow is probably married. All these signs strengthen the detective's conviction that the murderer is not the labourer his clothes would seem to indicate. He goes to headquarters, compels the prisones to remove his boots, and finds that his feet are caked with dry mud. He at once scrapes some of this away, and perceives that under the superficial coating of dirt the man's feet are soft and white and the nails well-kept. Lecoq believes that the fellow purposely dirtied them after his arrest. The only opportunity he had to do this was while he was locked for the night in a cell at a suburban police-station. The detective immediately examines this cell, and perceives that the prisoner emptied his drinking-water on the dusty floor and shuffled back and forth in the resulting slush. To make quite sure, Lecoq compares the mud he scraped from the man's feet with that left on the floor, and finds that it is composed of similar particles.

Although the mysterious prisoner has been placed in a special cell to prevent any news from reaching him, it soon becomes obvious that he *does* obtain news from outside. Lecoq learns that Mai — the prisoner's assumed name — has been permitted to study a volume of Bérenger's songs, and that he sings these lustily at a certain hour every morning. The detective causes the man to be taken to the governor's office the next day, and at the hour Mai generally began to sing, Lecoq repeats the same verse, imitating his voice. Instantly a pellet of bread, containing a message in cypher, is flipped through the tiny window from the grounds. Since Mai has only the book of songs, Lecoq reasons that the figures on the note must correspond to certain words in the book and decodes the message. Finally, Lecoq's theory is vindicated; Mai is the Duke de Sairmeuse. The Duke had discovered that his wife was being blackmailed. Disguised as a labourer, he followed her to the haunt where the criminals compelled her to meet them, and for the honour of his ancient name, and in order to protect his unhappy wife, he killed the blackmailers.

In 'Dossier 113' a banker is robbed of a large sum of money which had been placed in his private safe. The secretary, a young man with expensive habits, is arrested as the thief, because only he and his employer possessed the keys of the safe and knew the combination. Furthermore, the secretary had been repeatedly ordered not to leave large sums in the house overnight; yet he had deliberately disregarded these instructions. A deep scratch near the lock of the safe becomes the principal clue. Lecoq perceives that this scratch is fresh. He tests the paint, and discovers it to be extremely hard. His experiments demonstrate that a mere slip of the key could not have scored the surface so deeply, therefore a second person must have come on the scene and violently pulled the thief's hand away just as the key was being inserted in the lock. The detective thereupon orders an examination of the banker's and the secretary's keys, since traces of the paint will naturally be found on the tip of one of them. Lecoq fully expected this test to be conclusive, but to his surprise it is the banker's key which has been used. This leaves the intervention of the person who pulled the thief's hand away with such violence unexplained. Lecoq's subtle brain senses a woman somewhere in the background. Instead of arresting the banker, he investigates the wife's past, and discovers that she has an illegitimate son, a ne'er-do-well, who visited his mother in secret when in need of money. It was he who had stolen the key, wheedled the combination from the unhappy woman, and entered the house at night. The mother had surprised him busy on the safe, and it was during a struggle for the key that the paint had been scratched. Bertillon used the same method of investigation with success in the famous Rémy case, although he would not admit that he had been inspired by Gaboriau's novel.

The investigation in 'L'Affaire Lerouge' is carried out by a queer character named Tabaret, but dubbed Tirauclair by the police. He was for many years a clerd in a stock-broker's office, but puzzles of every kind attracted him, and finally he became an unofficial auxiliary of the Sûreté. It was he who taught Lecoq how to proceed in an investigation, and in the following story

Tabaret is at his best. A woman residing in a Paris suburb has been found murdered. She has been stabbed in the back by a long, thin blade, much like that of a foil. The police, all unskilled at that time in the art of reading the minute traces a murderer always leaves, are unable to visualize what occurred. Tabaret is summoned, and proceeds to investigate in his own fashion. After an hour's work he rejoins the *juge d'instruction* and lays a series of what to-day are termed exhibits on the table, and relates what he has discovered.

'This crime,' Tabaret declares, 'was not committed for gain. The assassin arrived here before nine o'clock; rain began to fall then, and although there is some dirt from his boots under the table at which he sat, there is no mud. His visit was unexpected, and Madame Lerouge had begun to undress — you see she has a shawl over her cotton bed-jacket — and was pulling up the weights of that clock against the wall, when a knock came on her door. I have examined the clock — it must be wound every twenty-four hours. There is a chair before it and the weights are hanging midway. The mark of the dead woman's foot is still visible on the leather top of the chair. She must have known the assassin, since she admitted him without hesitation. He is a tall young man and was well dressed. He wore a silk hat, carried an umbrella, and smoked a Trabuco cigar, using a holder. Here are plaster casts of his footprints! Examine the elegant shape of the sole and the small heel! Instead of crossing a flower-bed in the garden, he leapt over it, his deep toe-marks on both sides prove it, and the leap was over five feet, therefore the man was young and vigorous. He searched for something after the murder and felt with his hands in the dust on the top of that wardrobe; only a tall man could do that. Had he stood on a chair he would have looked instead of passing his hands over the surface. His silk hat has left a circle on a small, dusty table, and his umbrella made several clear imprints in the soft earth outside. I came to the conclusion that it was an umbrella and not a stick, because not only the ferrule but the end of the cloth have sunk into the ground. I found two Trabuco cigar-stumps in the grate, and the ends were neither wet nor bitten, so he used a holder.

'The woman and her visitor sat and talked for some time — note that he had leisure to smoke two cigars — and that bottle of cognac is half-empty. It was specially opened for the visitor, because the cork and corkscrew are still on the table. Then at some time the man killed the woman with a very thin stiletto, which he wiped on her apron, leaving two narrow lines of blood. She struggled for a moment and clutched at the murderer's hands. He was wearing grey gloves, and some shreds from these are under her nails. Thereafter he searched for a document, which he found and threw on the fire. The ashes are on top and the fire was almost out. Then, as a blind, to make us believe that robbery was the motive for the crime, he tied some silver and other trifles in a napkin and left, first extinguishing the candle. That proves he was cool, determined, and deliberate. I am certain the assassin was a young man of good family, and this woman probably blackmailed him.'

The sequel proves Tabaret to have been right!

When Gaboriau conceived this story, such precision was unknown to investigators. To him belongs the merit of having drawn the attention of the police to the importance of taking plaster casts of footprints and the value of a minute examination of dusty surfaces. The method he indicated for determining the height and age of a man by his stride, the need for a close scrutiny of the victim's finger-nails, and many other details are all taught to modern detectives. It is true, Gaboriau did not foresee that one day the flakes of burnt documents could be read, yet the methodical analysis and deduction displayed by Tabaret and Lecoq, in other stories, certainly did much to show what scientific investigation may accomplish.

The last of the series is a perfect résumé of the manner in which an expert should proceed when called to the scene of a crime. The body of the Countess de Tremorel has been found in the park surrounding her mansion. She and the Count had remained alone the previous night, because all the servants had gone to a wedding. When the police arrived, they found that every room in the house had been broken into, the furniture smashed, drawers and cupboards emptied of their contents, curtains torn from their rings, and even the upholstery of chairs and sofas pierced and torn. Blood has drenched the stair-carpet, and the imprint of a blood-stained hand is found on a door. In the dead woman's boudoir tea had been prepared, and on a table in the dining-room are eight empty bottles and five glasses. A large sum, which the Count had drawn from his bank two days before, is missing, and the police believe that it was this sum which attracted the criminals, and that the Count was also murdered and thrown into the river. Traces on the lawn show where at least one body was dragged over the grass, and not far away is a slipper and a silk muffler which belonged to the Count.

Lecoq is called in, and at once perceives that there are *too many* apparently obvious clues. He believes these have been manufactured and that the whole thing is a *mise en scène*, which, as usual in such cases, has been overdone. The clock in the boudoir is lying on the floor. It is not broken, but has stopped at three-twenty. Since the servants did not leave until four the previous afternoon, this would seem to indicate 3.20 A.M. No tea had been served before their departure, and it appeared extremely unlikely the Countess would prepare tea for herself just before dawn. Lecoq moves the hands of the clock until they point to the half-hour, whereupon the clock strikes eleven. That then is the time at which the crime was actually committed, and, as he thought, every seeming clue has been faked. He examines the bedroom, and perceives that although it is apparently in great disorder the bed has not been slept in; his arguments are conclusive and have become classical.

'To give a bed the appearance it would have after a person has slept in it,' he explains to the police, 'can only be done *by sleeping in it.* See — the pillows are rumpled, but look at the bolster, there is no sign of the deep impress a head and shoulders would leave. Moreover, the sheet and blankets have been thrown back at the top, but they are still tucked so tightly under the mattress from the end of the bed to the middle that it is evident no one has lain beneath them. Yet more important than these trifles is the second mattress. Look, it is smooth and flat, not a crease, let alone the depression two heavy people lying in it for several hours would inevitably leave.' Lecoq then examines the five glasses in the dining-room with a lens; not one has the characteristic smears that lips would leave had they been used for drinking, and in his haste the criminal mixed the various wines, of which he poured a little into each glass, with some vinegar which had stood on the sideboard. The footprints in the garden, intended to convey the impression that a furious struggle had taken place, were all made by the same man, who, Lecoq suspects, was the Count himself. His suspicion becomes a certainty when he finds that a pair of the missing Count's boots exactly fit the impressions. As a final proof Lecoq discovers the Count's dressing-gown and his second slipper under a cupboard in a corner of the bedroom, whilst a complete outfit — clothing, overcoat, boots, and hat — is missing from his wardrobe. Lecoq traces the Count to an obscure lodging and the man commits suicide to avoid arrest.

The detective's procedure in this story is simple, logical, and obvious, but it demonstrated the value of minute traces and paved the road for modern investigators.

The adventures of Sherlock Holmes are too well known to require retelling, but many of the methods invented by Conan Doyle are used now in the scientific laboratories. Sherlock Holmes made the study of tobacco ashes his hobby. It was a new idea, but the police at once realized the importance of such specialized knowledge, and to-day every laboratory has a complete set of tables giving the appearance and composition of the various ashes, which all detectives must learn to recognize. Mud and soil from various districts are also classified much after the manner that Holmes describes. Dr. Locard, who was in the French Secret Service during the Great War, was able, by examining the stains on soldiers' and prisoners' uniforms, to determine from what sections they had come. Conan Doyle made Holmes a complex personality; not only a tracker, but a logician and an analyst, and thus evolved and disseminated successfully the constructive method adopted since then by all criminal investigation departments. In the story 'The Cardboard Box,' Holmes unravels the puzzle, because he observed that the ear of an old lady had all the hereditary characteristics of the several ears which had been sent to her, and not long after, Bertillon wrote a monograph on this theme. Holmes is also a clever chemist, and the police of every country now have expert chemists in their service. In the 'Study in Scarlet,' Holmes discovers a reactant which precipitates blood and nothing else, and he distinguishes between arterial and venous blood. That also has become a distinct branch of criminal investigation. Poisons, handwriting, stains, dust, footprints, traces of wheels, the shape and position of wounds, and therefore the probable shape of the weapon which caused them; the basic principle of cryptograms — all these and many other excellent methods which germinated in Conan Doyle's fertile imagination are now part and parcel of every detective's scientific equipment.

It cannot be doubted that it is to these clever books the detective chiefly owes his recent extraordinary popularity, although stories describing the detection and hunting down of criminals have always delighted old and young alike. They combine the excitement of the chase with the satisfaction of beating an opponent in a game that calls for acute mental activity. The primeval instinct of the hunter is still very strong in mankind. To watch and lie in wait and then to pounce suddenly; to match cunning with cunning; to take by surprise when the quarry believes itself safe is thrilling and fascinating. Moreover, the unceasing and inevitable warfare between the malefactor and the police and the delight men take in solving intricate puzzles are also a vital manifestation of Nature's law — the survival of the fittest. On the day we shall have ceased to crave for excitement or to take part in contests for superiority, we shall have arrived at the summit of civilization, but before us will be only the steep down grade to mental and physical degeneracy.

Until lately, however, the great reading public was denied any real insight into the occult methods of investigators and compelled to satisfy a natural curiosity with fiction. The detective remained a mysterious entity living aloof from his fellows, a member of a dread society, almost a species of legal 'Black Hand,' with powers, ramifications, experience, and knowledge only unveiled to the initiated. *Nemo me impune lacessit* is his motto, and to this is added a dread of the unknown forces of which he disposes. But although criminal investigation is a mystery to the honest citizen, it quickly ceased to have any terrors for the professional lawbreaker. The old dictum of familiarity, no doubt. It was his business to study and observe the police just as they have to study him; and he soon came to believe them very human and vulnerable, because in order to approach him and learn his secrets, the detective was compelled to assume the language and manners of the denizens of the underworld. But to the honest man, the methods of those who fight for his security are still to a great extent a sealed book. It is the object of these stories to initiate the reader into the secrets of *real-life detection*, to describe the complex and wonderful instruments with which science has armed the law, to relate what actually takes place at home and abroad when a crime has been committed, and to show that very soon criminals, no matter how cunning, will inevitably have to pay the price of their misdeeds. It is not an exaggeration to state that in the very near future the methods for discovering and punishing those who prefer the crooked path to useful citizenship will have become infallible. And because that infallibility will have been attained by the adaptation of scientific knowledge to the needs of the detective, instead of the morally degrading system of depending on spies and informers only, this evolution will also have for effect to bring him into the light of day. He will lose none of his powers and he will steadily gain in prestige.

Some may argue that to disclose the means by which criminals are tracked is to arm these with knowledge which may help them. The same was said when it became generally known that a criminal could be identified by his finger-prints. Nevertheless, it is only exceptionally that a burglar or murderer wears gloves. The reason is obvious. Forced to shun the light, his fingers are to him so many sensitive antennæ, and to cover them with leather or rubber makes them useless. Furthermore, it will be seen that the scientific police laboratories are now so formidably armed, at any rate abroad, that whatever a man may do, he *must* leave some trace by which he will be found out. And that will make crime, if not impossible, at any rate so dangerous and unprofitable that in sheer despair the novice, and perhaps even the hardened offender, will turn to honest work. Although many officials may become superfluous, the community has everything to gain by such a result. Only lately the Gutteridge murder demonstrated that even a bullet or a cartridge-case carries marks impressed on its surface, produced by the weapon from which it was fired, by which it can be positively asserted that such and such a pistol was used. Thus a day must inevitably come when a man will feel that no crime can be committed with impunity.

Criminal investigation is in reality divided into three distinct and separate methods: the primitive system of spying and bribing men of the criminal class to become informers and betray their fellows; the science of tracking the criminal from minute traces left by him on the scene of the crime, and by his manner of operating, which to the trained observer is often as plain as a signature; and the classification of the various types of habitual law-breakers and the certainty of recognizing a man or woman who has already been convicted, no matter how disguised and no matter under what alias he is hiding.

Among savages and hunters, the art of tracking man or beast, with the faculty of arriving at a logical conclusion by deduction from tiny clues, was, and is, in some cases, still practised as a science. It degenerated in civilized lands as the senses degenerated and became dulled; and thus the use of informers and an elaborate system of spying and keeping criminals under observation replaced the better method. Only lately, with the help of wonderfully perfect instruments, has criminal investigation again begun to tread the upward path to the perfect science it should be. The system of betrayal has nothing to recommend it. It is degrading for the officers of the law, who are forced to consort with and to reward men who in reality hate and despise them. Such creatures inevitably sell to the highest bidder, and nearly always run with the hare and with the hounds; and what is more important, the system fails utterly when a crime is committed spontaneously or by an amateur, by someone who, since he is not a member of the criminal clan, has, fortunately for him, no pal to give him away. Science and brains only can successfully combat crime; for to-day, motor-cars, aeroplanes, and the resources of chemistry and electricity are at the disposal of those who prey on their fellows, and they have begun to use them quite as much as the police. If one considers what large sums are spent on rewarding informers, it is clear that this money could be used more efficiently to install scientific laboratories capable of dealing with any eventuality. A case which demonstrated how useful such laboratories can be, and how much those specialists in criminology who direct the forces of which they dispose can help the law, occurred recently in Paris. Deprez, a bank messenger, disappeared. His last call was at the house of a man named Nourric. He and his brother-in-law, Duquesne, were immediately suspected of having murdered the unfortunate collector. There was, however, no proof against either of the men. Because Deprez had made his last call at the house of Nourric, it did not follow that he had been murdered there. He might have been waylaid and killed on his way home, or he might have absconded with the important sum he carried that day. Worst of all, no body had been found, and without the *corpus delicti* there can be no prosecution. Nourric and Duquesne were therefore simply kept under observation. It was, however, ascertained that they unexpectedly paid their rent and also various debts, although for some time past creditors has besieged them in vain. Questioned on this point, Nourric averred that he had won money at the races. Again the detectives on the case were at a standstill. Meanwhile, every nook and corner where a body might be concealed was being searched, and dogs and divers explored the Seine and the Marne, although both rivers were at a considerable distance from the house. Then abruptly the detectives discovered a queer vehicle in the workshop of a wheelwright, where the suspected men had left it for repairs. It was the *poussette* which later became so notorious. This was a species of pushcart, made of two bicycle wheels fastened under a deal box, to which long handles had been added. One of the wheels was twisted and several spokes broken. Nourric and Duquesne, who were bricklayers and jobbing electricians, proved conclusively that they used this home-made vehicle to transport their tools and material. They declared that on the day following the disappearance of Deprez, they had carried a heavy load of bricks and piping to a contractor's yard. This was found to be true. But — at the laboratory — tiny smears of blood were found on the sides of the deal box, and the blood was human. Nourric triumphantly pointed to a jagged cut on his right hand.

'That is where the blood came from,' he cried with a twisted smile. So far, the police were hopelessly beaten. But now the laboratory expert set to work. Microscopic examination disclosed several tiny grey hairs in the congealed blood, and these hairs had been recently cut by a barber's scissors. The hair of the suspected men was long and tousled, but the missing employee had been to a hairdresser on the very day he was last seen. Thereupon, Nourric and Duquesne were detained and a *juge d'instruction* nominated. A week later, a boatman dragged a sack from the Marne which contained the body of the unfortunate Deprez. He had been killed by a blow on the head. Insulated wire was twisted round the body, which was doubled up and terribly swollen, but nevertheless identified. The hands were fastened behind the back by a handkerchief — an ordinary sixpenny bandanna. Although grave suspicion rested on Nourric and Duquesne, they could not be convicted without definite proof. This proof M. Bayle, the head of the Paris laboratories, obtained in a manner so striking that, whilst in truth he has carried out many infinitely more complex and difficult investigations, the public and the jury were startled by the precise details and unshakable logic of his demonstration. The common sixpenny handkerchief had a flaw in the weaving, a flaw due to a mistake committed by the weaver on his loom. It was ascertained in which factory the fabric had been manufactured and also that this particular type of red-and-white cotton was made in squares of so many yards. Eight dozen handkerchiefs had been cut from the piece. These were traced to the tradesmen who had bought them and from these to the various customers. The flaw ran through every single handkerchief. The mother-in-law of Nourric had bought six, but could produce only four. The fifth was found in the pocket of Nourric — and the sixth — twisted around the wrists of the dead man. This last proof of the culpability of the two prisoners was final; the jury found them guilty and they were sentenced. It is a remarkable instance of the great services the scientists in the laboratories will be called upon in future to render to the police, and the value which otherwise unimportant clues can acquire when submitted to their expert examination. The flaw which the expert discovered was merely that there were *six red threads too many* in one of the stripes. Without the science of the laboratory such a trifling difference would certainly have passed unnoticed.

Nor are the experts obsessed only by the desire to establish a man's guilt. There are many cases on record where the laboratory succeeded in proving a suspected person's innocence.

A short time ago, a shop was broken into and the safe rifled. The door which was forced had been recently painted, and the yellow paint was deeply scored where the burglar had split the wood with a chisel. The police arrested a man who was known to have been already convicted for housebreaking, but who since his release from prison had been in steady employment. A tool discovered in his room was smeared with yellow paint, apparently the same as that on the shop door. On this evidence, the fellow, who had unfortunately been seen near the scene of the crime, was committed for trial. The laboratory expert examined the paint on the chisel and some taken from the splintered woodwork. Under the ultra-violet ray lamp, the former glowed with a red fluorescence whilst the sample from the shop became white. This led to chemical analysis, and it became evident that their molecular composition was totally different. The man was, of course, released, and a week later the real burglar was caught.

Yet, although scientific knowledge and precision are indispensable for tracking criminals, they are not enough. The craft of a modern detective reposes upon broad basic rules, and his studies must before all be methodical. Every branch of the knowledge he acquires is a fragment of the complete edifice, and built upon a foundation termed the criminal identity. It was with this that Alphonse Bertillon began when he evolved the verbal portrait.

CHAPTER II

IDENTIFICATION OF CRIMINALS

THE BERTILLON METHOD — FINGER-PRINTS AND DISGUISES

The most important department in all criminal investigation centres is that which deals with identification, and every modern detective's education is based on the methods which enable him to recognize an offender, notwithstanding the changes wrought in his appearance with the passing years and in spite of the multiple tricks of disguise and even wilful mutilation to which criminals often resort. Finger-prints now assist the police materially in this herculean task, but only if the suspected or wanted man has at some time in his career been arrested. Then, indeed, they once and for all establish his identity. But even so, when a detective is searching for a fugitive from justice, he cannot, because of a fancied resemblance, step up to a man in public and take his finger-prints. Nor can he lightly arrest anyone on suspicion merely for that purpose. He may, it is true, keep him under observation until he feels reasonably sure that he has discovered the offender — but that is just where the difficulties begin. At the least sign of danger the quarry will flee — use disguises — or go into hiding. Moreover, a man who has committed a crime does not wait, generally, until he perceives he is watched, but will alter his appearance at once. The necessity for certain identification, and similarly for the permanent segregation of constant offenders, has always existed, and in the past a hand or foot was lopped off, or the branding-iron used, in order to render outlaws and evil-doers easily distinguishable from the honest citizen, but such barbarous means are no longer compatible with our ideas. It was not until 1890, however, that the police authorities, in order to rid the community more efficiently of habitual and professional criminals, set to work in earnest to discover some method whereby a man or woman could be at once recognized in spite of altered appearance or change of name, and be definitely classified as one of those who, from lack of moral stamina or because of some hereditary taint, drift through life adding crime to crime. At the time the difficulties encountered by the men who searched for such a method appeared insuperable, and no definite system could be found which excluded all possibility of error and was at once efficient, infallible, and simple. It was Alphonse Bertillon, a clerk at the Paris police headquarters, who first evolved a practical form of 'police identity records.'

Since 1882 he had worked incessantly, experimenting on thousands of arrested persons, in order to ascertain whether there existed some point on which no two human beings resembled each other. Nearly always inventors begin with a complex theory and simplify as they progress, and so it was in this case. It was not because Bertillon was unaware of the queer seal each man carries at his finger-tips, that he preferred his anthropometrical chart and measurements, but because it had appeared impossible to him at the time so to classify finger-prints that each man's record could be found immediately. That was the difficulty. Of what use to possess a number of cards each bearing the tiny black smudges which define the lines and ridges of the human fingers, if, when an arrested person was examined, a card recording a former arrest, filled in perhaps ten years before in another town, and under another name, could not at once be discovered?

Faced with this formidable problem of classification, Bertillon conceived a composite chart, which he termed *le portrait parlé.*

The verbal portrait is based on those parts of the human frame and features which nothing can alter; neither beard, wig, greasepaint, nor any of the clever devices invented by the professional criminal. Although it has been modified since the genius of Bertillon conceived it, the verbal portrait is still used by the police of many countries and every French detective is taught its intricacies. Not long ago its efficiency was proved once more, when an absconding banker of whom no photograph had been found was arrested in Paris whilst the police were searching for him in South Africa. The clever detective who made the capture noticed a man strolling along one of the boulevards, whose ears corresponded to the description which had been circulated, although otherwise his appearance was quite different. Ignoring the fellow's beard, moustache, curly hair, and tinted glasses, the detective mentally repeated the salient points he had memorized: 'Nose convex with drooping point, small scar on left temple, lobe of ears detached with abnormally deformed helix.' It was worth the risk, and half an hour later, despoiled of his hirsute adornments, the embezzler was shut in a cell. Before entering upon a detailed enumeration of the characteristics which make such clever captures possible, it will not be without interest, perhaps, to describe some typical instances of amazing disguises in circumstances which excluded the possibility of identification by finger-prints. The photographs which illustrate several of these examples are taken from the rogues' gallery and have been placed at my disposal by the chief of the finger-print and *portrait parlé* department, M. Guérin. Some time ago a wealthy lady, whose entire fortune was in valuable Government bonds, which foolishly enough she kept hidden under a loose board in her bedroom, was found murdered. She had been strangled by means of a silken cord, cut from her bedroom curtains. Robbery was not at first believed to be the motive, for nothing in the house had been touched. Inquiries elicited the fact, however, that neither the bank nor her legal advisers had been entrusted with the considerable sum which it was certain she had possessed. Thereupon a minute search of the premises brought to light a cunningly contrived hiding-place under the floor. This proved that the murderer must have been an intimate friend. The loose board fitted so well that it could not have been found by chance. Among her friends was a well-known doctor who had practised for many years in Algiers. This man had disappeared and could not be traced. A description obtained from the neighbours was vague, although all were agreed that he was a handsome, dignified man of forty-five or thereabouts with curly hair and beard slightly flecked with grey. There were only two outstanding points which everyone had noticed: his eyes were a peculiarly hard grey-blue and his short somewhat tip-tilted nose had a tiny lump on the bridge. Detectives searched high and low, for many months. Then one day, whilst classifying the Bertillon charts at the Paris headquarters, where all prison photographs are grouped, the officer whose work this was happened to examine a double photograph of a convict undergoing a two years' sentence for robbery at Brest. He was struck by a curious tiny lump on the man's nose. The photograph was shown to the murdered woman's friends and neighbours, who laughed derisively at the mere idea that so hideous a creature could be mistaken for the handsome doctor. Yet upon investigation many apparently insignificant details came to light. Twice when applying to the prison doctor for medicines, this convict had used technical terms common to the medical profession; he had committed his crime with unwonted stupidity, as though anxious to be arrested; and his steely grey-blue eyes had been remarked many times. The prisoner was transferred to Paris and orders given that his hair, beard, and moustache should be allowed to grow. The transformation was extraordinary, and when the sceptical neighbours were taken to view him in his cell, they instantly recognized the man. It was the missing doctor, who had purposely committed a foolish crime, convinced that nowhere would he be so well hidden as in prison. But proof was still lacking that he had murdered the old lady. When his short sentence expired, he was released, but closely watched. Yet once again he disappeared. A year passed before a detective, applying the spoken portrait method, ran him to earth in Toulon. He had become a veterinary surgeon, and was esteemed by all. It was fortunate that his arrest took place when it did, for he had sold his practice, assured that he could now leave France without danger, and was preparing to cross into Italy. In his house were the bonds stolen from the murdered woman.

I imagine the photographs facing page 26 demonstrate how difficult is the task of the detective when clever men, with no previous criminal records, set their brains to work to outwit the police. Only the subconscious observation of the specialist, trained to disregard all but the basic human structure, brought about the doctor's downfall. As another instance there is the case of a confidence trickster. When first arrested he was a handsome, black-haired man with drooping moustache. Unfortunately for him the shape of his twisted nose, his ears, and the various details, which I shall describe at length, were entered on his chart. The man was an habitual criminal and was sent to French Guiana. Two years later he escaped and all trace of him was lost for several months. Every detective had memorized his description, but when not long after a triumphant officer brought him to headquarters, even the hardened chief of the identity department gave a gasp of surprise. The young man of thirty-five with wavy black hair had undergone a miraculous metamorphosis. His hair was straight, his forehead high, and his long flowing beard that of a man at least sixty. But the nose, the ears, and the eyes were the same. At the end of an hour every measurement was found to correspond. How the change was brought about, I am not at liberty to say. But his discovery was truly a triumph for the police. No wonder the fellow had walked the streets and felt secure (Fig. I).

The grey-visaged convict in the illustration (Fig. II) was a dangerous burglar. No doubt he looks the part in prison garb, but who, meeting the handsome bearded man he became when released, would recognize him? He was arrested two years later in a small provincial town under a different name. His papers, bought from a receiver, were those of an honest manufacturer of Lyons. Thanks to an excellent record, the court took a lenient view of the theft which had brought him to the dock. He told a pitiful tale of a foolish love for a worthless woman, and the Bérenger law for first offenders was applied. His chart was nevertheless sent to Paris, where he was recognized as the grey-haired convict. Instead of being released, prison walls prevented him from

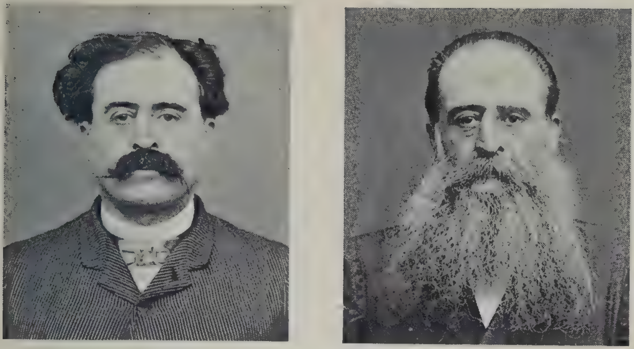

Fig. I. (*Left*) A confidence trickster as he first became known to the police
(*Right*) Ten years later, when he was recaptured

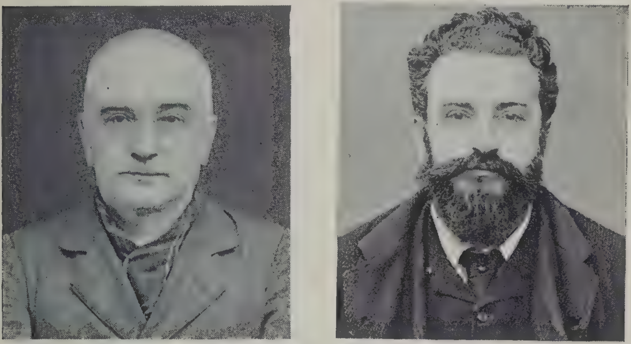

Fig. II. (*Left*) A burglar in prison garb. (*Right*) The same man two years later

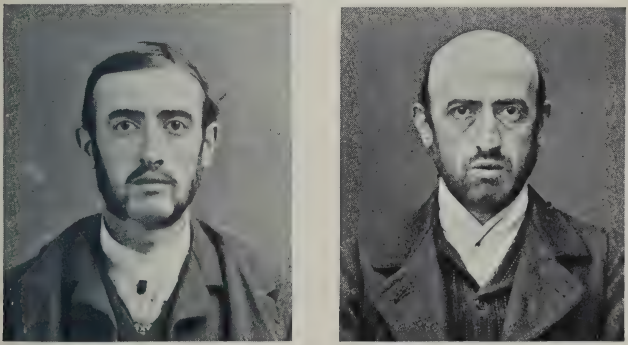

Fig. III. A valet who resorted to voluntary mutilation to avoid capture. Note the broken nose and the head shaved to produce artificial baldness

POLICE PHOTOGRAPHS OF CLEVER DISGUISES

committing further depredations for ten years. The photographs of the third example are not perhaps so striking, but they are interesting because the apparent baldness is artificial. The man was a valet and had enjoyed a good reputation. He specialized in giving information to burglars, who, thanks to his assistance, were able to enter the premises without difficulty and knew exactly where to find money and valuables. When at last the police became suspicious because burglaries occurred wherever the valet was employed, the man vanished, and for several months no trace of him was found. He is one of the few who resorted to voluntary mutilation to evade the detectives. When captured he admitted that a friend had smashed his nose in order to change his appearance completely. Liquid paraffin was also injected under the eyes, and this, together with the apparently bald head, certainly made it difficult to identify the man. Only the Bertillon measurements could be relied upon, for the police did not possess his finger-prints.

Thus it will be readily seen that finger-prints alone are not sufficient when dealing with resolute and clever criminals who have escaped arrest. Also I hope it has been shown that superficial observation is useless. The untrained eye is easily deceived by hair, beard, or similar aids to disguise, and only an elaborate system which teaches the detective to visualize the underlying and unchanging structure of the human form can cope with the vast, mobile, cunning underworld of crime. There is another aspect of certain identification which I fancy is important to everyone. An honest man may be mistaken for a criminal and wrongly accused, as there are many people who have a double, superficially at least. Although this resemblance is non-existent when every feature is taken separately, few of us possess the ability to analyse a face synthetically. It is a curious fact that, although apparently a simple matter, nothing is so difficult as to compose a correct detailed description of a man's or woman's features. We all know that, if ten people are requested to formulate the same person's appearance, no two versions will tally. Probably this is so because the human face is such a familiar object that the eyes have become blunted to its distinctive features, just as a man in a factory no longer pays any attention to the ear-splitting howl of a circular saw. A proof of the absolute inability of most people to describe a face so that it stands out as a separate entity is the manner in which a passport is generally filled in: 'Eyes grey-blue, mouth normal, nose small,' and so forth: a description that can be applied to thousands. Yet it is an indisputable although astounding truth that no two people are absolutely alike, and that each face may be described verbally in such fashion that it can be instantly recognized by the trained observer. To enumerate all the details of the Bertillon method would fill several volumes, but a general *aperçu* of the fundamentals will make it possible for anyone to employ the system efficiently.

The spoken portrait is divided into:

(1) Chromatic characteristics; that is, the distinctive pigmentary signs, such as the colour of the iris, eyebrows, hair, skin, and beard.

(2) The racial characteristics of the Anglo-Saxon, the Latin, the Oriental, Negroid, and Mongolian.

(3) The morphological divisions which comprise the shape of every constant feature.

How much the organs that compose the human face vary in size and shape, the photographs (see frontispiece), taken from a booklet which is used to instruct French police officials, will show. I omit the jargon of abbreviations which are used in France, and which all detectives must learn. They are complex, but to the initiated are as plain as Pitman's shorthand to the practised stenographer.

One of the reasons why the layman cannot memorize a face in words is that he has no vocabulary to suit the need, and it is this vocabulary which was one of the first things the experts created. When we can describe a man as medium-tall, muscular, and corpulent; brachycephalic (round-headed) with low forehead; short, straight black hair coming to a point between bushy eyebrows; *clean-shaven, with large ears set at right angles to the skull; eyes black, deep-set, small, and mobile; nose flat, Negroid, with wide nostrils; fleshy lips; angry red bullet scar on left cheek; bulldog chin; abnormal canine teeth!* — we already have a mental picture of a simian, criminal type which would fix his unpleasant personality on our memory. If to this description is added a swarthy skin, hairy forearms, and an anchor tattooed on left hand, we visualize a Celtic or Latin seafarer, who is either a petty officer or a trader, since the hard life of an ordinary seaman would not be conducive to corpulency.

Yet the description is far from being technically complete and could still be applied to some hundreds of men. Something more definite is needed to make it absolutely individual. It must be remembered also that should the fellow fear the police, he could by hard work diminish the corpulency, and he could easily let his hair grow, and shave the typical point between the brows. A beard and moustache would hide the teeth, chin, lips, and scar; glasses the eyes, and gloves would cover the tattooed anchor. Thus the foregoing elaborate description would become useless. In order to pick out such a man in a crowded street, the trained observer would require details which nothing could conceal or alter, and these the Bertillon method supplies.

The verbal portrait must not, however, be confounded with the famous anthropometrical system. The latter is a description obtained by means of instruments, measurements, and photographs. The other is the systematic identification of a criminal from a distance, by means of the eye alone, in circumstances where neither camera nor instruments can be used. It is an instantaneous analysis not only of the composite personality, but of each feature. The layman when he wishes to describe a nose, for instance, will use the terms *short*, *long*, *fleshy*, *curved*, or *tiptilted*. He has no words for the countless noses which are neither curved nor tiptilted. It is necessary, therefore, to analyse that feature by taking as a basis those characteristics which vary most in every human being. These are:

(1) The hollow at the base of the nose.

(2) The ridges which form the profile of the organ.

(3) The angle from the base to the nostrils and their distance from the cheek.

(4) The angle or slope of the extremity.

(5) The length of the point from the juncture of nostrils and cheek; and finally the width at the base and at the nostrils.

How infinite the variety of human noses may be is seen in Figs. II and IV of the frontispiece. Then to the shape is joined the colour, and thus we may have the formula: (1) Deep; (2) convex; (3) drooping; (4) low; (5) red medium. Each of these terms is entered on the chart in abbreviation, and any specific malformation, scar, or discolouration would be added. It is fairly obvious that if the descriptive terms are found to fit the nose of a suspect, the detective may proceed to the mental enumeration of the characteristics of his other features. No doubt this clumsy and lengthy description makes the system of visual recognition appear cumbersome and impracticable, but in reality the eye of the trained observer will seize upon the vital points in a fraction of time. The great difficulty which the experts encountered in establishing their basic tables was the constant repetition of the definition *medium*. It is a fact that a laxity of expression causes us to classify most normal beings as medium: medium height, medium eyes, and so forth. In reality there is no such thing when the complete picture is established. A man's nose may be lacking in distinctive character, but when taken in conjunction with his eyes, brow, mouth, wrinkles, hair, and skull, he ceases to be without distinctive characteristics. Whenever a feature is truly featureless, it is omitted. Only those forms which oscillate between a maximum and minimum are useful for a verbal description. There is some distinctive trait in every man's appearance, and when this is added to the minute analysis of even commonplace features, he becomes a definite entity not to be mistaken for another.

The visible parts of the human eye are the eyeball, the iris, and the pupil.

The iris varies according to the amount of pigmentary substance, fluctuating between pale blue, slate blue, dark blue, and light hazel, light brown, and dark brown. There are no grey or black eyes. The grey is always a light slate blue, and black is never a true black, but merely a very dark brown. There is also the tint commonly termed green, which is really a superposition of blue on yellow, with a predominance of the latter.

These colours are modified by lines, spots, or other irregularities. Many eyes are deeper in tint near the pupil and lighter near the eyeball, and there is also the curious milky circle termed the 'senile halo.' To these colour definitions is joined the technical description of the shape of the eyes; their position, which may be protruding or deeply set, and the colour of the eyeball, which may be blue-white, yellow, or mottled. Moreover, many people's eyes are asymmetrical or dissimilar in colour, and there are the numerous diseases of the eye, and abnormally small or hyperdilated pupils. Hair is classified chromatically as Albino fair, light yellow, medium fair, dark fair, ash blond, light brown, medium, dark brown, and pure black. The last is found only in Spain and the East. Then there are the many gradations of red, familiar to all, and the various degrees of grey to white. To the colour is added the quality: straight, wavy, curly, and so forth; the many types of baldness, and the manner in which the hair covers the occiput and the forehead. Baldness may be nascent or very pronounced; tonsural, frontal, or fronto-parietal. There is also total alopecia to be considered, since there are men who have neither hair, eyebrows, nor eyelashes. Naturally, beard and moustache are taken into consideration, but they are not important. What is important, because generally constant, is the complexion, which runs through an infinite number of tints from livid to apoplectic, and from lemon-yellow to dark brown.

Without becoming technical, I hope it has already been shown, at least partially, how a grouping of all the component details of a human face will gradually cause an individual to emerge from the amorphous state until he suddenly becomes clear, distinct, and not to be mistaken for another, be it even his twin brother. The mouth, ears, and skull are, however, the essential features which will complete this résumé of criminal identification. Although essentially a subject of especial interest to the scientific investigator, the ability to memorize faces and to pierce disguises may not be without its uses to every one of us. The ability to observe details subconsciously is not to be disdained. There is the famous Peltzer case, for instance, where a criminal deliberately created a fictitious personality. He used a wig, a false moustache, and greasepaint, and for several months, under an alias, masqueraded as a wealthy shipowner. He murdered a lawyer, whose wife and money his brother coveted. How easily the victim could have identified the pseudo-shipowner had he examined the ears, eyes, skull, nose, and facial angle, instead of letting his eye be deceived, as most of us do, by a composite picture.

I believe I may state without fear of exaggeration that every man or woman at some time in his life could have usefully applied the verbal portrait, and to artists the Bertillon method will certainly come as a boon. The appearance of the nose, brow, eyes, and hair, although necessary for the composition of a complete verbal portrait, is in reality secondary in importance to the lips, ear, and shape of the skull. A practised actor can introduce pads into the nostrils; a wig will hide the forehead; glasses will transform or cover the eyes; and nothing is so easy to alter as the colour or texture of the hair. It has been proved, however, that there is no method whereby a fugitive from justice can transform his lips, change the shape of his skull, or alter his ears; moreover, the shape of these features never varies from the cradle to the grave, although it is true that sometimes the expression of the mouth is unstable. The ears, the skull, and the lips are therefore the tangible synthesis of our ancestral inheritance; for each one of us represents the apex of a pyramid built by a million forbears. Every thought, every act, every crime committed in the past adds its particle to the load of heredity we all have to bear. And to the precise student of mankind the meaning of every minute detail is as obvious as the phosphorescent gleam in the eyes of the feline which proclaims it the nocturnal hunter. But I do not intend to analyse the human form philosophically. I am concerned in this chapter only with the indelible characteristics which our evolution has created, and which help the detective to identify a suspect. Like the conjuror's trick, when the *modus operandi* is explained and people exclaim 'How simple!' so it is with this method of coördinating the human identity. But it required a genius such as Charles Darwin, whose life's work gave Bertillon a firm basis on which to build his method, to make these fundamental principles apparent to all. A glance at the frontispiece (Fig. IV), which depicts several types of heads, will make the layman realize how great may be the variety of human features. These have not been chosen because they are exceptions; they are still almost normal. Let anyone who is not convinced that *no two human faces are alike* spend half an hour in a railway train and apply the method I have already partially described.

The shape of the skull is immutable after a man has ceased to grow. A beard or a hat may change it superficially, but the criminologist soon learns to gauge the basic structure, just as the artist does when he examines a sitter. Some of the commonest forms are: round, square, asymmetrical, lozenge-shaped, distended zygomatic arches, or abnormal parietal breadth. Then there is the pyramid type as opposed to the long and narrow; the flattened skull, and the pear shape. The distinctive character is often more markedly visible in profile than in full face, therefore the Bertillon method has specially analysed this point of view. When the angle and shape of the forehead, the nose, the lips, and the chin have been examined in detail, the description is completed by a comparative study of the general effect and the relative position of each feature, to which is added deviation from the normal. In order to simplify such an examination, the human profile has been divided into sections. The line, for instance, which extends from the apex of the forehead to the extremity of the nose is termed the *fronto-nasal section.* Among its countless forms the Greek profile, famous because adopted by most of the classical sculptors, is not often encountered. It is characterized by a straight line from brow to nose, with no indentation at the juncture between the eyes. Such a profile is termed *continuous.* A deviation from this is the more or less accentuated concavity generally seen at the base of the nose. Again, the angle of the nose and brow may be alike, but the imaginary lines are parallel instead of coincident. This is usually produced by a prominent forehead which may, nevertheless, be quite straight.

A totally different shape, although it belongs to the regular type, is the double arch, where the forehead and the nose have identical curves, like the arches of a bridge. Some of these forms are seen in Fig. IV (frontispiece). The second section is the *naso-buccal* profile, which rings all the changes from projecting upper lip and retreating chin to the prognathous bulldog face. In the first case the prognathism would be *superior,* in the last *inferior.* These terms indicate the upper or lower jaw, Thus, by this systematic sectioning of a face in profile, we have reached the lips, where again the characteristics are countless. There is the breadth of the upper and under lips, their thickness, projection, and malformation to be examined. Their colour must also be considered, since it may vary from pink to red, and from livid to blue or purple. Lips are also described as adhering or detached according to whether they cover the gums and teeth or hang loosely drooping. I hardly think it necessary to enter into the details of the chin, for to describe it at length would require much space. The human chin in profile varies indefinitely. Some few forms are also seen in Fig. IV. More important than any feature yet mentioned is the ear, for unlike the other organs it assumes its definite shape immediately after birth and remains unchanged throughout life. It is not an exaggeration to say that no two human beings have ears exactly alike. Therefore this complex organ has become the final test of identity and with the form of the skull completes the profile portrait.

The ear, roughly, is composed of an outer edge — the helix, the tragus, the concha, and the lobe. The shape of the helix, and therefore the external form of the ear, in conjunction with the channel between the outer and inner rim or anti-helix, are first to be considered. Then there is the shape of the point and the lobe. The size of the lobe and its adherence to the skin are very important. The angle at which the ear is set; its position, its colour, its size — each of these details when closely observed are seen to differ in every individual. A criminal may be a genius at disguise, but he cannot change his ear; that is why tables of all the known types have been made and the Bertillon portrait is always focussed on the ear.

Finally there is the shape of the skull, its variation from the normal; and the shape of the neck.

Then in the full-face portrait there is the mouth to be considered. Specially important are its position, shape, colour, and expression; and by expression I mean the permanent wrinkles which form in an adult and merely deepen with the passing years. Wrinkles when they are deep enough to be permanent are always noted. These may be on the forehead, between the eyes, beside the nose, or even on the neck; and their shape often indicates the individual's social standing or profession, and even his racial origin. The position of facial wrinkles are in part due to speech and the involuntary grimaces speech provokes. Therefore they will vary according to the language. There remain yet the eyebrows; but like all hair, one can hardly classify them as permanent. I have, however, chosen a few examples to illustrate how even eyebrows vary (Fig. I, frontispiece). It is, of course, hardly to be expected that anyone but a criminologist will take the trouble to memorize all these details. Yet I should like to show how useful a general knowledge of this method of verbal portraiture may be to everyone.

I have often read with amusement descriptions of wanted men in the press, where quite seriously — not the features, but the hat, the tie, or the overcoat of a wanted man were enumerated! No doubt even the most simple novice was grateful for this warning and made haste to rid himself of such trifles. It would be more to the point if his facial and immutable characteristics were published, although the first thought such publicity must awaken in the wanted man is how to hide or alter these details. And when the description merely mentions hair, moustache, or colour of eyes, even a moderately clever man can discover a method of disguising them. But were a complete verbal portrait sent along the wires, or telephoned to every district now that the British police are to have a system of telephone-boxes, such as the Americans have used for years, why, then, the fugitive might indeed find concealment a difficult problem. We will suppose, as an instance, that a crime, an assault, or a theft has been committed and that the criminal was seen. The policeman's first question is, naturally, 'What was he like?'

If, instead of the vague 'Oh — small, dark, with a bowler hat,' the witness could reply according to the formulæ I have given, it is certain the man would not get far before such a detailed description, telephoned from relay to relay, would cause him to be captured. There are always certain points to be gleaned even if but a glimpse of the man was obtained.

His height and corpulence; the shape of his nose, mouth, chin, brow; and the colour of his hair would certainly help the police. And if the man was a neighbour, a tenant, or a fellow worker, the verbal portrait might be complete in every detail and thus infallibly bring about his arrest. It is to be remembered, too, that the trifles found on the scene of a crime will often help to establish his probable appearance, for they may be hairs from the head or beard; or scratches on a wall over which he climbed, which would indicate his height.

There was a murder case not long ago when suspicion rested on two men. One was dark and one was fair. It was essential that the police should not lose a moment in arresting the guilty man, for it was feared that he would destroy certain very valuable evidence if he could but gain a day. There were reasons why both the suspects could not be detained, and the arrest of the wrong man would have given the other the desired opportunity. The expert investigator reported that the criminal was dark. He was arrested, and it was found to be indeed so. When asked by the *juge d'instruction* on what he had based his deduction, the expert produced a pocket-comb. 'This has been used for combing a moustache,' he said; 'there is dark-brown, dry cosmetic between the teeth. A fair man would have used white or yellow.'

The finger-print system is being perfected daily, however, and several specialists are beginning to adopt a new classification termed *mono-dactyloscopic*, by which even single finger-prints will lead to the criminal. It is difficult to state definitely when man first realized that no two human beings had the same formation of lines and ridges on the fingers. Certainly the Chinese already utilized thumb-prints as signatures in the fifth century, and Sir William Herschell, Governor of Bengal, issued instructions in 1850 that every native's signature should be accompanied by the impress of the right thumb. He had discovered that annuities were being paid to dignitaries who, according to his reckoning, had long been dead.

Nevertheless, it was not until 1880, upon receiving a letter dealing with the subject from Charles Darwin, that F. Galton began to study the indelibility of the queer lines on the human finger and evolved a system of classifying these which is still in use at Scotland Yard, although superseded by a simpler and more efficient method in Paris. Scotland Yard has to deal with only about four hundred thousand charts, whereas in Paris the identity department has now well over eight million. The marvel of the new system, which has proved entirely successful, immediately becomes apparent, if one considers what such a figure represents. These charts are centralized in endless galleries, all connected by telephones. Thus among these eight million charts, any previous record can be found in fifteen minutes, by submitting ten or even only five finger-prints to the identity expert. Experience has shown that there are five fundamental species of prints. They are clearly seen in the photograph facing page 78, Fig. I, which is used to instruct the French police. On nearly every finger the numerous lines are coördinated around a central nucleus, and above one or two secondary points. The nucleus is termed the centre and the other points delta. In type number one, there is no sign of a delta. The lines merely cross the finger in superposed curves. This is therefore the simplest type. Number two has a centre, and a delta to the right. Number three has the delta to the left. In these two examples the lines are really loops, running around the centre and open at one end. In number two, they are open to the left and the delta is in the right corner; in number three, the opposite formation is evident. Number four is more complex. There is a centre, and a delta below on each side. The lines are whorls or concentric spirals and completely closed around the centre. Finally, there is number five, which has two distinct centres around which are concentric spirals and a delta below in each corner.

All human finger-prints belong to one of these five classes. When the five inked fingers of the left hand are placed on a card, the types to which they belong, counting from the little finger, give a formula, say, 1 5 4 2 2, and the right hand, continuing from the thumb, 4 4 3 3 2. That is the number, then, under which the chart of the subject is classified. Thus by a simple calculation between the formula 1 1 1 1 1 — 1 1 1 1 1 and the formula 5 5 5 5 5 — 5 5 5 5 5, there is room for 9,765,625 combinations! Some of these will be rarely found, others in great numbers. Therefore, in order to distinguish between the charts coming under the same numerical combination, it is, of course, necessary to subdivide them. This is done in the following manner: The first type is subdivided by counting the lines above and below the centre and the number obtained is marked below the figure 1. Prints two and three are sectioned by a line passing through the nucleus and the delta, and the number of lines between the centre and the delta are counted. This number is also entered with the formula. Since these lines may run from two to thirty, an excellent subdivision is thus obtained. Types four and five are classified according to whether the concentric rings twist to the left or the right. Curiously enough, it is the index finger which varies most and therefore plays a useful part in giving the formulæ greater variety.

The types most often met with are numbers two and three; number two for the left hand and three for the right. It has also been established that, whereas loops running from a centre and away from the delta are mostly met with among the white races, the spirals, types four and five, predominate in the yellow race. In order to classify the various prints immediately, an ingenious instrument has been in use for some time in the technical laboratories. It is in reality a species of photographic enlarger termed an *epidactyloscope*. The chart is placed in a slip under a lens and illuminated. The tremendously magnified image is thrown on a horizontal white screen. It is thus a simple matter for the expert to count the lines which will give him the correct formula without using a magnifying glass. The question has often been asked: Is it not possible that two people may have the same lines? To this one may answer with an emphatic No! During the thirty years that police and criminal investigation departments have collected and examined finger-prints, there is not a single case on record in any country of two persons having the same formula. The number of combinations which can be obtained by the five types and their subdivisions from ten fingers is expressed by a number composed of *sixty figures*, whereas the number of human beings on the earth at any one time is about five milliards. Since most people have ten fingers, this would be equal to fifty milliards. If we divide the number obtained from the possible combinations by fifty milliards, we have a number composed of forty-nine figures. Therefore, we should have to assemble all the imprints of the human race since man first appeared on this globe and continue to do so until long past the duration assigned to the sun by scientists, in order to discover two people with the same formula. I'm sorry — I hate figures myself, but that is the answer — No!

Finger-prints are left on any smooth surface, because in every one of the lines of the hand there are numerous small openings or sweat pores. It is the slightly greasy moisture from these which causes the marks. It would be wrong to say where the criminal usually leaves these invisible traces, but the method of discovering them may be shortly described. By a special device, any likely surface is illumined obliquely, and if there is any sign that a hand has rested there, powdered oxyde of lead is dusted over it with a soft camel's-hair brush or even sometimes sprayed from a special spray. The lead oxyde adheres to the finger-marks. If the object which has been touched is portable, it is taken in special carriers to the laboratory. If it is a fixture, a gelatine sheet, such as photographic citrate paper, which has first been exposed and developed, is soaked in water to cause the gelatine to swell. The paper is carefully blotted and then squeegeed over the marks made visible by the lead oxyde. When the paper is peeled off, the transferred imprint is apparent in white on the black surface of the gelatine paper, which is then photographed. An additional characteristic has lately been utilized, which has facilitated identification when only one or two prints were found on the scene of a crime. A photographic enlargement is made and the sweat pores in each line counted. These are never the same in two people, and although alone they are insufficient to establish a criminal's identity, when taken in conjunction with the finger-print they make it possible to find the chart without the complete formula. Furthermore, these sweat pores cannot be produced artificially, although finger-prints have been manufactured on two occasions by a clever device; thus if traces are found in which the pores are lacking, one may assume that no living finger made them.

It may be thought that experience has taught criminals the futility of attempting to alter their appearance, since a synthetic analysis of their features must pierce the cleverest disguise. There have been men, however, who were so skilful in this art that for a time they evaded capture. Moreover, disguises are often used by the police when they suspect that their appearance is familiar to the criminal whom they seek. Rarely, however, does the detective resort to such theatrical expedients as a wig, beard, or moustache. A false beard can be detected by the merest novice, and a wig has to be absolutely perfect to deceive anyone in daylight, since complexion, eyelashes, the colour of the eyes, and eyebrows must all be in keeping with the wig, and this is not easily accomplished. Make-up for the stage, where a reasonable distance separates the spectators from the actor and where the light is soft and constant, is a totally different matter from make-up that will bear a close scrutiny. The art of disguise for the street is in truth an 'art,' which requires much practice, a profound knowledge of the criminal mind, and exceptional adaptability. The first rule to be observed, which a novice usually fails to observe, is that a good disguise should always harmonize with the surroundings in which the detective is compelled to work and must not attract any attention. In other words, it should be natural and inconspicuous. Criminals have an extraordinarily quick eye, and the tiniest detail that does not fit in will put them on their guard. This means that a detective who intends to play the part of a sailor, dock-labourer, or chauffeur, must know everything about the trade he has assumed for the time being. Every criminal specialist inevitably acquires certain stigmata just as every trade produces idiosyncrasies which the trained observer at once perceives. It is foolish to imagine that by merely donning seaman's clothes a man will look like a sailor. A life spent at sea creates an atmosphere of its own. We all know that the sailor does not walk as does a landsman; furthermore, a sailor does not smoke as others do, he does not drink what others drink, his hands bear the marks of his profession, his speech has an unmistakable quality of its own; even the expression of his eyes, from constant gazing at distant horizons, is characteristic of his trade. He prefers certain haunts, and his mannerisms are quite distinctive.

I well remember the case of a detective who was seeking a sailor wanted for murder. He bought some clothes which smacked of the sea at a second-hand shop, but his ignorance of the essential details which distinguish the deckhand from the man who works in the engine-room, his want of knowledge even of technical terms, caused his true calling to be suspected at once. He escaped a sound drubbing from several indignant sailors only by making himself scarce, and what was worse, lost his man. This applies to most specific disguises. Imagine a detective trying to be a 'coster' and not knowing where the fraternity buy their goods nor the current prices; or a pseudo-carpenter carrying a mechanic's hammer! Such trifles are obvious only when pointed out, but the specialist notices them at once. It has become the rule among the men of the Sûreté to learn thoroughly all there is to be known about the part they intend to play. They 'cram' as for an examination. One rule always to be observed is — *never wear new clothes!* Overalls, cap, boots — all must have been worn, and well worn. Usually, the officer who desires to disguise himself successfully buys an outfit which has been thoroughly seasoned, from someone in the trade. Although disguises *are* used in England, they are not so necessary as abroad, because no town in England is infested by such criminals as those with which, for instance, Paris or Marseilles has to deal, nor is there the same profusion of technical jargon and slang. Another reason is that the British police dispose of more detectives than the police abroad. As at Scotland Yard, the Sûreté has trained men who deal only with one type of offence. Some combat the drug traffickers, others pickpockets, others again the confidence tricksters. This system has many advantages, but the detectives quickly become known, and are therefore compelled to use disguises. It is obvious that when a criminal comes before the courts for trial, many of his pals are sure to be present in the public enclosure or gallery; and when the detective who made the arrest goes into the witness-box, his name and rank, which prosecution and defence repeat loudly enough for all to hear, are noted — for future use — and his appearance carefully studied. Thus, after only one or two cases the detective has become a familiar figure; he is immediately spotted, and some sort of disguise becomes indispensable if his career of usefulness is not to end. It is not always necessary to alter the face. If a house or a street is under observation or a man being shadowed, the great thing is to vary the outline — the silhouette. When the wanted man emerges from his hiding-place or before he enters it, he gives a quick glance around; if there is nothing suspicious in the appearance of a couple of navvies standing before a public house, or if a figure that fits the neighbourhood is shuffling aimlessly along some distance away, all is well; but should that same figure be there again later, or even appear to follow him, the criminal will take alarm at once. This means quick-change work for the detective in order to transform his outline. One of the smartest men at the Marseilles Sûreté always carries a pair of rope-soled shoes in his pocket, and wears light footgear which will easily fold; another pocket holds a rough cap, and his hat, although purposely of the Tom Mix type, is made to roll up. Under jacket and vest he wears a workman's blue overall. Should his quarry appear suspicious, he steps into a dark doorway; hat, shoes, coat, and the rest are crammed into a small sack or wrapped in paper and he emerges a moment later in canvas *espadrilles*, blue smock, bandanna neckcloth, and cap. A stoop or lumbering gait is assumed, and the tall figure in the wide-brimmed hat has disappeared to be replaced by a slouching labourer, with grimy face half-hidden by a cap. A second change can be effected as quickly by stuffing the smock and cap into the sack. The neckcloth is twisted round the head, a pair of ear-rings are affixed, faked rents in the trousers pulled open, and thus dressed, with gaudy, ragged shirt open at the neck, the labourer has become a Neapolitan fisherman just arrived from the harbour. The sack is then left in a café or handed to a policeman on point duty. These changes are perfect because they are not helped out by false hair of any kind. They will even stand a close scrutiny, although if the shadowed criminal does not enter a wine-shop, this is never to be feared. The photographs opposite page 48 show two of the most famous French detectives: M. Le Cardic, a Breton — who is usually given the task of tracking murderers or burglars, and does it alone — and M. Dulage, who specializes in pickpockets and confidence tricksters. Each of the disguises has been selected because they were successfully adopted in notorious cases.

Figure I is M. Le Cardic as he is known to his chief. Figure II was used recently to hunt down a dangerous murderer at Marseilles. Perhaps it may be well to recall the main facts of the case. A comfortable villa — the Pergola Fleuri — standing on the beautiful Corniche Road, facing the Mediterranean, was inhabited by husband and wife and one servant. One night there came a sharp ring at the bell, and the servant went to open the gate. A moment later two shots cracked, followed by a woman's shrill screams of pain. Without hesitation the proprietor of the villa ran down the garden path towards the sounds. Two men abruptly appeared armed with pistols and ordered him to put up his hands.

With a shiver of dread he saw the unfortunate servant sprawling near the gate shot through the head. Foolishly enough, the man tried to seize one of the intruders. Again the pistols spat red flames, and the unhappy owner of the Pergola Fleuri collapsed without a moan. Meanwhile, his wife had opened one of the windows and called wildly for help. Alarmed at her cries, the murderers fled without obtaining the money for which they had come. The task of the police was extremely difficult, for the only persons who had seen the criminals were dead. Yet a week later one of the men was arrested. He naturally put all the blame on his companion. He protested that they had only met on the evening the crime was committed, and that he knew nothing about the man beyond the fact that he was named Pierre — who he really was he had never learned. They had truly planned the burglary, but murder had not been included. The report of the laboratory expert, Dr. Béroud, proved that all the fatal bullets came from one pistol, and this weapon was not the one found on the accused. Unfortunately this helped him but little, for his pistol had also been fired recently, and two bullets from it were discovered in a tree. Now came the strange sequel, which most readers will remember. The uncle and the nephew of the notorious Corsican bandit Romanetti were murdered in atrocious circumstances in their little island home. By a series of patient investigations the police discovered that the leader of the assassins was the missing man known as Pierre. After his exploit in Corsica, he was believed to have returned to Marseilles. Le Cardic knew that only by a ruse could he discover his lair. He donned a white trench-coat and wide-brimmed hat, and altered his face by the help of a moustache and glasses. Thus disguised he resembled the

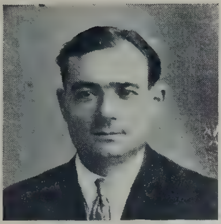
Fig. I. M. le Cardic as he is in private life

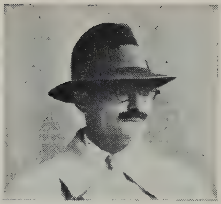
Fig. II. As he appeared when he captured 'Pierre'

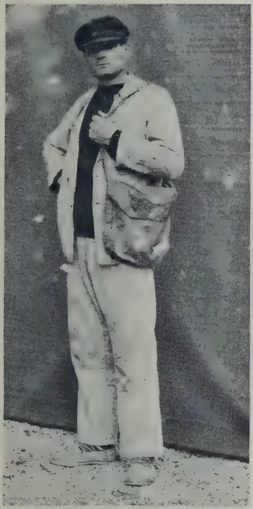
Fig. III. M. le Cardic as a dock laborer

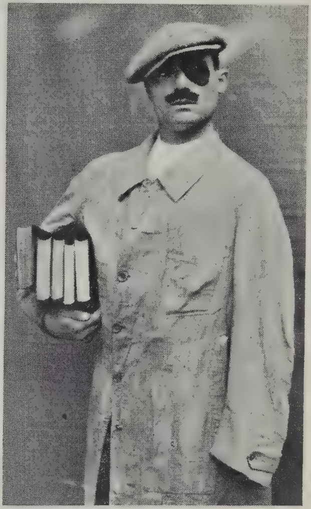
Fig. IV. As a one-armed book salesman

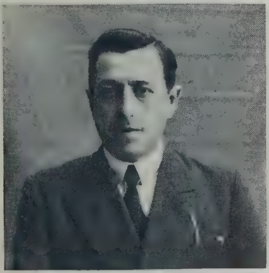
Fig. V. M. Dulage in private life

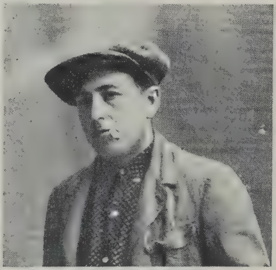
Fig. VI. M. Dulage as a loafer

TWO FAMOUS DETECTIVES AND THEIR DISGUISES

accomplice who had been captured at the outset. In order to make quite sure that the disguise was good, he approached two of his colleagues on duty, who knew nothing of his plan, and requested them to direct him to a certain café. They failed to recognize him, and he had great difficulty in convincing them of his identity. Greatly encouraged, Le Cardic went to a former haunt of the arrested man and, after a suspicious look round, whispered into the ear of the proprietor, 'Where is Pierre? They've released me. Quick, I want to warn him.' The innkeeper at once gave him the address of a lodging-house in the suburbs, and an hour later the murderer, who believed that his accomplice had come to see him, was handcuffed before he could offer any resistance, and safely locked in the cells. Yet the only clue the police had discovered was that the fellow's name was Pierre — not much to go upon.

Figure III is the same clever detective in the clothes he generally wears when on duty at the harbour. It is the traditional dress of the Mediterranean stevedores and dock-labourers.

Figure IV resulted in another important capture. Burglars had stolen bales of silk, tweeds, and other cloth, valued at a million francs, from a well-known wholesale house. The investigation led the police to suspect that a certain tailor would be chosen as the receiver. His shop was in a very quiet street, and several hidden spies instantly gave warning whenever a detective appeared. Le Cardic had noticed that there was a small bookshop not far away. He called there as a one-eyed, one-armed traveller in books, and obtained a post as outside salesman. In this way he was able to watch the tailor's premises all day without attracting attention. The police were convinced that the thieves would not risk bringing their merchandise at night when detectives might easily be hidden in dark doorways. The signal agreed upon was that Le Cardic should drop a number of books on the pavement when the police were to carry out their raid. A man had been posted with binoculars on a roof so that he could see the bookshop, but was invisible to the watching spies. The ruse was entirely successful. Day after day at the same hour an innocent-looking delivery-van unloaded bales of cloth at the tailor's shop. When sufficient evidence had thus been collected, the police suddenly barred the street at each end; the apparently stupid and crippled salesman became a very active and formidable officer, and thieves and receiver were captured and the stolen wares recovered. The arrest was so utterly unexpected that the criminals had no time to make use of the weapons they carried.

As a house-painter — a convenient trade for looking through windows on a first or second floor — or dressed as a loafer, M. Dulage has also done some good work. Photograph VI shows that no detail is neglected; even before the cold, pitiless eye of the camera the make-up is perfect. It is amazing how a face can be altered by such trifles as pads in nose and cheeks, a three-days' stubble of beard, spectacles, or a scar. Broken teeth are faked by the use of pitch or black wax. But all these trifles must fit the part. A young Parisian detective once entered a *bal musette* — the apache's equivalent of a dance-hall — dressed as an apache of the type the films and music-hall artistes have made popular. He was not aware of the fact that apaches, when they relax, put on clean clothes, wear showy and expensive shirts, collar and tie, and pay especial attention to their shoes. These are always spotless, although pointed, high-heeled, and effeminate in appearance. Fortunately two detectives were already on duty at the *bal*, and the young officer was got out alive.

Criminals make use of disguise quite as much as the police, either whilst working or when trying to escape. They have learned from many forced visits to the Bertillon Department that their hereditary foes pay little or no attention to clothes, beards, wigs, or any of the helps which the novice would naturally seek, and that the verbal portrait, invented by Alphonse Bertillon, describes those parts of the human features and frame which cannot be altered. They know that the forehead and its numerous characteristics, the colour of the eyes, the size and shape of the nose, and the ears are invariable. Only lately a swindling banker was arrested in Paris because detectives recognized his ear. He evidently believed that a newly grown beard and moustache, and tinted spectacles, had completely altered his appearance, and he was actually sauntering nonchalantly along one of the main streets when he was captured.

There has been no case reported yet of a criminal with false ears. No doubt it will come, for the unceasing struggle between police and malefactors has given birth to many strange devices. Carouy, one of the terrible Bonnot gang, evaded capture for several weeks by an heroic measure. His eyes were peculiarly small and round, and every police-officer had been informed of this. Carouy sent a friend to buy a lancet, some cocaine, and a hypodermic syringe. When his skin was sufficiently numbed by an injection of the drug, the outer and inner corners of the eyes were slit and held apart by sticking-plaster until the slit skin was healed. The effect was extraordinary. His round eyes now appeared to be long and narrow. He was seen one day by two detectives, who allowed him to pass because the eyes were different from those of the man they sought. All would have been well had the friend who performed the operation not given him away.

Another clever trick was resorted to by a banker noted for his curly hair, ruddy complexion, and brilliant black eyes. He was a striking figure, although somewhat corpulent. The police counted on capturing him with ease. As a matter of fact, when he passed the watching detectives at the frontier he had become a thin, pallid, elderly man, completely bald, with inflamed, rheumy eyes. Soon afterwards the Belgian police communicated with the Sûreté and reported his capture in Antwerp just as he was leaving for the States on a Dutch-American steamer. Everyone at the Sûreté felt sorry for the fellow when they learned by what means he had fooled them. Whilst in hiding he had cut down his daily food to dry bread and water. This soon removed the bloom from his cheeks and the fat from his body. The internal use of certain drugs and permanganate of potash in his washing water gave him a truly sallow complexion. Then, when he was ready to fly, the fellow had shaved his head, grizzled the fringe of short hair which had been left to accentuate the artificial baldness, and inflamed his eyes by the clever use of an irritant. This utter contempt for physical pain was worthy of a better cause.

CHAPTER III

THE MINUTIÆ OF SCIENTIFIC INVESTIGATION

FIREARMS AND BULLETS

ALTHOUGH a rough classification of ammunition and weapons was undertaken many years ago by expert investigators, the possibility of proving, not only that a bullet was fired from a certain type of firearm, but of definitely establishing whether a gun or pistol found by the police was the actual weapon the criminal used, is quite a recent innovation.

In order to realize such precision the scientists required instruments of which the police-officer of former days never dreamt. True, the instruments existed, but their utilization for tracing criminals has only become practicable since the Sûreté created police laboratories, equipped them with every instrument necessary, and placed famous scientists at their head. It is due to such men of genius as Bertillon, Balthazar, Lacassagne, and Locard that every phase of crime investigation is carried out with as much minute attention to detail as the most complex research in molecular physics. The identification of weapons may now be considered infallible.

Only four types of firearms have to be considered as likely to be used by criminals. The old-fashioned revolver which fires a leaden bullet, the modern five- or six-chambered revolver with brass or copper-sheathed projectiles, the automatic pistol, for which the ammunition is nickel-jacketed, and the shotgun. The latter is almost exclusively the weapon of the poacher. In America the rifle and even the machine gun are sometimes used for a hold-up by robbers, but as a rule the revolver and the automatic pistol are the favourite arms of criminals. They are small, deadly, and easily carried in the pocket. But if the pistols used to-day are all much alike in shape, the various types are numerous. Browning, Colt, Webly, Smith & Wesson, Mauser, and Parabellum are familiar names, not to mention the many French and Belgian models.

Although their component parts are machine-made, they are finished off by hand, and every workman has his personal touch. File, hammer, and polisher leave tiny lines and scratches, which are almost as varied and individual as finger-prints. Indeed, even two pistols adjusted by the same mechanic will not have quite the same tool-marks. This is especially noticeable in the rifling. The five or, in some cases, six helicoidal ridges, no matter how well-polished, bear microscopic scratches, which are, of course, faithfully reproduced on the bullet. Furthermore, each type of firearm has certain fundamental characteristics which make it a simple matter, apart from the calibre, to recognize the weapon by searching for their presence on the surface of the projectile. Let us deal with these basic impressions first. The automatic pistol has a loading-clip. In the Browning the cartridge, with its nickel-covered bullet, is slipped obliquely into the clip and held in position by a spring. The two narrow flanges on each side at once leave a sharp line on the cartridge-case. When the sliding barrel is snapped back to let the first cartridge fly into the chamber it strikes against the steel sides; the firing-pin indents the percussion centre, and the recoil and ejector again scratch and score the metal case as it flips out, whilst the bullet receives its series of deeply cut lines from the rifling. Thus the pistol and the revolver each produces a number of impressions, totally different in shape, and easily detected on bullet and case. The shotgun, to be effective as a death-dealing weapon, must be used at close range, so that the pellets do not disperse. Nearly always, therefore, the wad penetrates into the wound and becomes the chief witness against the murderer.

As the first example, let us take the identification of a pistol. The body of a man or woman is found. From the position of the wound it can be determined whether it is a case of suicide or murder. If the latter, the appearance of the bullet-hole indicates clearly the distance from which the shot was fired. Knowing this distance, the detective therefore searches the spot for the empty case. If he finds one, it is an argument in favour of an automatic weapon. Hardly ever does the murderer stop to search for and carry away the ejected cartridge. Probably within a certain radius the detective will also find footprints, a match, or a cigarette. If it is in a wood or shrubbery, shreds of cloth may have caught on thorns. If the murder was committed in a house, there may not be any of these signs, but the investigator will probably discover finger-prints, or the evidence of a struggle. The death-dealing bullet is then extracted by the medical expert, or, if it has passed through the body, it will be found lodged in wall or woodwork. In the latter event it will probably be deformed and even flattened completely.

It is now necessary to determine by the type and calibre the kind of pistol which fired the shot. Then, when the investigation has led the police to one or several suspected persons, bullets are fired into a lay figure from weapons found in their possession, and these are examined. There are four methods by which it can be ascertained whether the projectiles carry similar marks to those on the bullet taken from the body. The procedure employed in England recently was by comparison under a microscope. For this a double instrument is used. A rotating holder grips the fatal bullet, and those to be examined simultaneously are fixed under the duplicate lens, where they revolve slowly until the lines and scratches coincide. In Paris the *modus operandi* is totally different. The bullet is rolled carefully over a sheet of lead-foil by means of the apparatus shown in Figure I on the opposite page. This produces the curious chart seen in Figure II. The projectiles used for comparison are also rolled on lead-foil, and each sheet is photographed and enlarged to exactly the same size. The prints are then superposed or placed one against the other. If the shot was fired by the suspected pistol, all the microscopical lines will correspond. This method is simple, but not always practicable, although it has the advantages over the comparative double-microscope test that the adjusted photographs can be exhibited in court to the jury, who will thus see for themselves that no mistake has been made.

Then there is the Belgian test invented by de Rechter and Mage. Micro-photographs are taken of all the streaks left by the rifling. These are enlarged and placed against similar photographs taken of bullets fired from the suspected weapon. Finally, there is the method used by Dr. Béroud, of Marseilles, which is based on that invented in Belgium, but has the undoubted advantage of being efficient even when the bullet has been so flattened or deformed that it cannot be rolled. Dr. Béroud cuts through the projectile taken from the body with a special blade. The lead core is carefully melted, leaving only the jacket. This is then cut and spread out

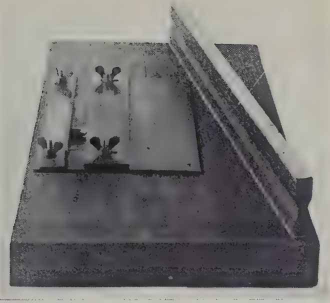

Fig. I. The bullet is rolled carefully over a sheet of lead foil by means of this apparatus

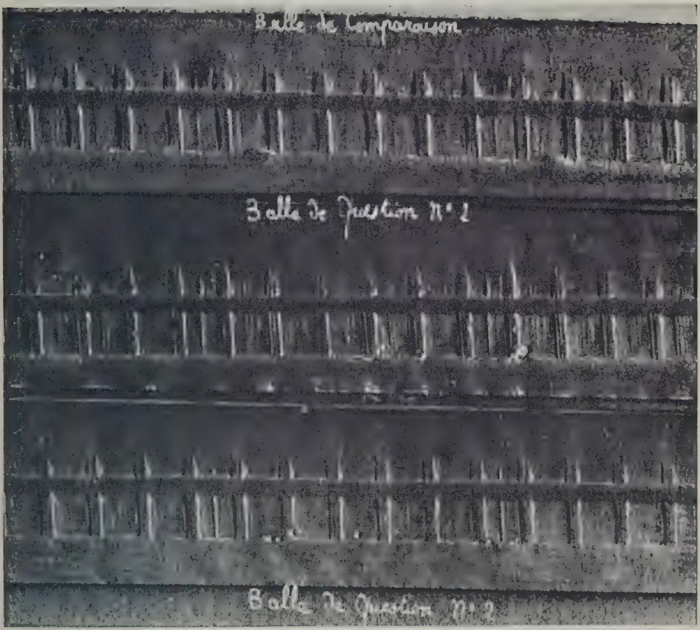
Balle de Comparaison
Balle de Question N° 1
Balle de Question N° 2

Fig. II. Foil showing marks made by bullets. The two lower strips are the records of suspected bullets; the upper was made by the bullet used for comparison

HOW BULLETS ARE IDENTIFIED

by a rubber roller until it is but a thin ribbon; and the same is done to bullets fired from the suspected pistol or pistols. The ribbons are photographed, enlarged, and compared. In order to leave no room for a possible error, the cartridge-case is examined and also photographed. It is rare that the firing-pin or the hammer strikes exactly in the centre. There is always a slight eccentricity even in automatic weapons, and this is much more apparent when dealing with a revolver. Of course, this eccentricity, due to faulty adjustment, is generally only a matter of hundredths of an inch, but when enlarged, it becomes very evident. Again the greatly enlarged photographs are compared and the minute differences measured.

A curious case occurred recently in the South of France which was investigated by the Marseilles laboratory. A soldier came in great excitement to the police and held out his cap. 'A man shot at me from behind,' he cried, and pointed to a hole at the top and at the side. 'I know who did it. I and a man named Fargol are both courting the same girl. He is a butcher and lives next door to her.' The police-officer who was on duty at the time retained the soldier's cap and sent it to us. A microscopic examination of the holes disclosed traces of gunpowder, and the edges were slightly singed. The shot had therefore been fired at close range. The cap was then placed on a dummy, and we at once realized that had a head been inside it when the bullet passed through the cloth it would also have entered the brain. A *juge d'instruction* sent men to search the room where the soldier had been living whilst on leave. A flattened bullet was discovered in the wall beside a hat-peg. The man's service revolver was confiscated and tested at the laboratory. The bullets fired from it were point for point similar to that found in the wall. Faced with these discoveries, the fellow broke down and admitted that he had hung his cap on the peg and then sent a bullet through it. His intention was, of course, to cause his rival to be arrested for attempted murder. The butcher, who thus escaped at least a long and unpleasant detention, has since become a staunch admirer of the formerly hated police.

Unfortunately, abroad, where firearms can be bought anywhere by anyone without the excellent and indispensable formality of obtaining a permit beforehand, this ingenious method of establishing the identity of a pistol loses much of its value, for before it can be applied the detectives must first discover the weapon, but in England, where a wise law prohibits all but licensed gunsmiths to sell arms, and then only upon production of a permit issued by Scotland Yard, in which the number and description of the weapon are inscribed, to be at once duplicated in the sales-book, such a method is very useful.

We will suppose that a man has been killed in London by a shot fired from a Colt forty-five. A round of the gunsmiths gives a list of two hundred people who have all bought such a pistol within the last two years. By eliminating those who are above suspicion, the list can be thinned out until only one or two are left. Shots fired from their pistols and compared as described would at once lead to the guilty person. Sometimes, when the bullet has passed right through the body, and the dead man has been carried from the house where he was killed to a spot far away, no bullet is found. It is hardly conceivable that enough metal remains on the cloth of the jacket, waistcoat, or shirt, through which the projectile tore its way, to enable the laboratory expert to determine the type of weapon used. Yet, extraordinary as it may appear, it can be done. Chemical tests would, of course, fail utterly, for the metallic streak left by the bullet could not be weighed by the most sensitive instrument, but there is, fortunately, spectral analysis and the spectrograph. By means of this instrument it is not so much the metal itself as the radiating energy of the atom which become visible.

Without going into ultra-technical details, a short *aperçu* may not be without interest. The cloth is carefully cut from around the hole and placed in the platinum container of an electric furnace. The container is again enclosed in a tube of quartz, through which a current of pure oxygen passes, until the heat of the furnace has transformed the cloth into a minute heap of flaky ashes. To these ashes are added a few drops of acid, the purity of which has been carefully tested. Into this liquid the fine point of a special needle is plunged, and the atoms of copper or nickel are deposited on the extreme point by electrolysis. These atoms will be invisible, of course, but they can be photographed. A high-frequency coil with powerful condensers is connected so that it will spark between the needle and another terminal in front of the spectrograph. This is an optical instrument, having a lens and a prism near the spark, and a long, narrow photographic plate at the other end. The resulting photograph will be the spectrum of the spark, and, if there is the slightest trace of metal other than that of the needle and the terminal, special lines, known and classified, will appear on the plate. They will correspond with the well-known spectrums of copper, nickel, or lead. Although the quantity stripped from the surface of the bullet may be less than one ten-thousandth of a milligram, the lines are so clear that the expert can state definitely whether the lead bullet of an old-fashioned revolver, the nickel-coated projectile of the deadly automatic, or a copper-sheathed bullet from a modern pistol was used to commit the crime. Indeed, by the strength of the lines he can even determine the type of ammunition. The photograph opposite shows a police expert using the spectrograph in order to determine the nature of the metal left on an overcoat through which a shot had been fired.

Of course the principal witness against a murderer is his victim. By this I mean that one cannot take a human life brutally in such fashion that the body does not reveal the means employed. In most cases the manner of death is at once a clue to the personality of the criminal; the shape of the wound discloses the kind of weapon which inflicted it; the position of the wound reveals whence the attack came, and is often an indication of the mental state of the murderer at the time he committed the crime. Only those murders can remain unpunished which are not recognized as such. Once the skilled investigator has been unleashed, there is little hope for the malefactor. It may be thought that a firearm, because it can be used from a distance, offers greater chances of immunity; yet no weapon leaves so many clues as a pistol or a gun. If the shot was fired at close range at the head, the skin will show the characteristic markings of powder; and the orifice produced by the bullet will be quite different from that caused by a projectile coming from a distance. The velocity is less and the angle of the bullet is no longer the same. The detonation also will generally be heard by someone who may have noted the time at which it occurred. The wound produced by a lead revolver bullet or that of an automatic is distinctive, and, finally, if bullet or car-

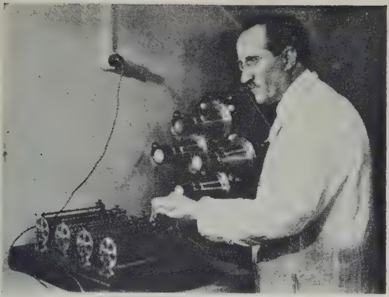

Fig. I. The chromoscope

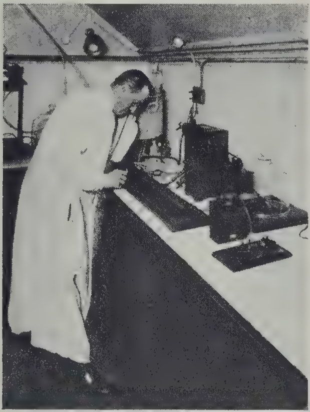

Fig. II. The whistling wireless apparatus

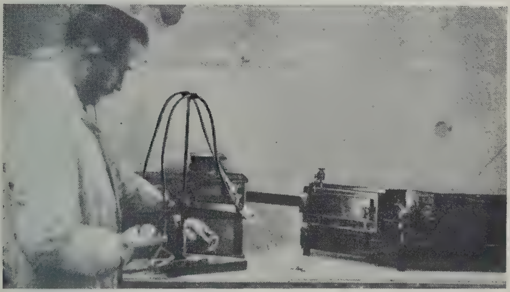

Fig. III. The spectrograph

SOME OF THE UNCANNY INSTRUMENTS USED BY POLICE EXPERTS TO DETECT FORGERIES

tridge is found, the weapon is identified with as much certainty as a finger-print.

I well remember a very queer case which occurred in the South of France, when the murderer would have been discovered by the analysis of the marks on bullets and cartridge-case alone, although there were other important clues. I can best illustrate a modern investigation of a murder committed with a firearm by relating the case at length. No doubt many people will remember the reports in the papers, for the crime was committed not long ago.

THE BULLET AND THE BODHISAT

I had dined opulently on *cous-cous* and chicken with red pepper, at the Auberge Provençale, and was about to enter one of the cafés on the Canebière for a Bénédictine to cool my tongue, when I felt someone lurch heavily against me on the right, whilst a steel chain was adroitly twisted round my left wrist, and a shrill voice squeaked: 'Don't resist! We've got you!'

Surprise held me motionless for an instant, but I knew that voice, and, as the chain was deftly whisked away, I turned and looked into the bland, simian eyes of François Levallois, once private investigator, but now the cleverest of the Sûreté detectives. I laughed and gripped his hand, and that of his inseparable friend, Jules Voltaire. I had not seen either for some time, but I knew they had been transferred from Lyons to Marseilles shortly after my return to Paris. Although the weather was unbearably hot, Levallois was still clothed in the well-remembered raincoat and bulky cap which seemed part and parcel of his queer personality. Short and squat, his huge feet and clumsy gait were as deceptive as his abnormally diminutive features. The bristling moustache and short imperial accentuated his tiny nose and narrow face, and his beady black eyes blinked at me with the sad, plaintive expression of a captive monkey. No one seeing him for the first time would guess that the man was lithe and active as a cat, and that his mind was equally nimble. Queer he was, but a genius for unravelling uncanny problems of crime. His friend Voltaire, who feigned to believe himself descended from the great philosopher, made an excellent foil for the little man. His red nose and ruddy face, twinkling blue eyes, and drooping moustache gave him the appearance of a caricatured gendarme. Neither carried a hint of their profession, and it was their greatest asset.

'I heard from the Sûreté Chief that you were here,' Levallois squeaked in that extraordinary voice, which in moments of excitement became almost a screech. 'You have come opportunely. Things have been quiet lately, but five minutes ago a motor-cyclist from headquarters interrupted our usual game of "*pokaire*," which Jules here still plays as badly as ever. A murder at the Villa Bella-Vista. The laboratory expert should be waiting for us at the Sûreté with the big Fiat. You'll be useful, so come along.'

I looked at my colleague dubiously. 'Where is this villa with the Italian name?'

'Oh, on the Corniche Road, not far from Toulon. Why?'

'Are you driving?' I questioned further, for I had a lively recollection of the little man's mania for speed.

At this he giggled like a girl and passed his arm under mine.

'Hee-hee — yes, I drive. So that's the trouble. Well, I promise to be most careful.'

Voltaire grunted doubtfully. 'Humph — that's what he always says; but I notice he loves that Fiat — she'll do a hundred and fifty kilometres an hour.'

Levallois grinned by way of retort, and held up his hand for a taxi.

The Sûreté Chief, M. Laforce, was waiting beside the huge car when we arrived. He expressed his satisfaction at seeing me, for it appeared that the laboratory expert had been summoned to the scene of another crime and would not return until the following day. I quickly collected the indispensable instruments and climbed into the Fiat beside my friend Voltaire. A slim pilot car was to precede us, to clear the road with its howling police-syren and guide us to the villa. Levallois settled into his seat, and with abrupt lurch and bellow we were off. Around by the harbour we proceeded with sudden snarling explosions from the open exhaust, broken by long intervals of silence as we slid in and out of the traffic. A few minutes later we entered the broad avenue leading to the coast, and with a satisfied purr the pace increased to the headlong rush of an express, and I knew that once again I should taste the thrill of throwing dice with Death. A broad, dazzling beam from our searchlight swept the road, the pressure of the wind swelled to a hurricane, and mile after mile flashed by in uninterrupted succession, until the continuous roar became hypnotic. Once the pilot in front sent back a warning flash, and I clutched the seat as the brakes were applied. Just in time the guide had perceived a line of wagons which blocked our path; then we sped on unhindered! Snatches of wild melody, crooned in a high falsetto, came from the queer imp at the wheel, and the tune, a Moorish lullaby, aptly fitted the drive. Voltaire pulled his cap to his eyes and hunched himself with bowed head, as though resigned to his fate, and I followed his example. But if Levallois loved speed, he was also the finest driver I had ever known, and an hour later we bumped over a rough path and came to a stop before a heavy iron gate. As I scrambled out, a brigadier of gendarmes came forward and saluted.

'What has happened?' M. Laforce asked, divesting himself of his leather coat.

'Monsieur Van der Haag, the famous painter, has been murdered, monsieur. He was found by a servant, lying on a couch in his studio, a bullet in his brain. His ward, Mademoiselle Collana, telephoned to me at once. I merely verified her statement without touching anything and placed two men on guard. The studio is an outflung and isolated wing of the house, and usually entered only from the garden, although there is an inner door. The painter was a crank. He hated to be disturbed when working, and had a horror of noises. I have questioned the servants. Apparently no one heard the shot fired, although the house and garden are very quiet; but the chauffeur recalled that about three in the afternoon, whilst he was busy in the garage, he heard a muffled detonation. He thought that it came from a passing car. About ten, however, the gardener, a Savoyard named Fernand Vallais, was crossing the lawn, when he noticed a man crouching by the door of the studio. At his approach the fellow turned and bolted, but he caught a glimpse of the face. It was Carlo Morelli, the composer, who lives not far away. It appears that he proposed marriage to Mademoiselle Collana, but Van der Haag was violently hostile to the Italian, and had threatened to thrash him if he came again. The painter evidently feared Morelli might come secretly to visit his ward, and had instructed Vallais to search the grounds every evening. The gardener ran after Morelli, and saw him slip through a small door leading to a by-path, which was usually locked. Either the Italian had a key or someone had purposely left the door open. The gardener bolted it and returned to report what he had seen. It was then he discovered the tragedy. I went at once to Morelli's house, found him half-undressed, left gendarmes on guard with strict orders to prevent him from leaving the room or communicating with any one, sent a motor-cyclist to you, and waited until you came.'

'You have done well,' M. Laforce replied. 'Who is in the house besides the servants?'

'Mademoiselle Collana and the dead man's son, Pierre, who had been at his club all the afternoon and evening. He arrived a few minutes after we came.'

'Did he know what had occurred?'

'Yes — mademoiselle had telephoned to him. He is frantic with grief.'

'You say this Italian had quarrelled with the painter?'

'So it appears. He and the girl are certainly in love with each other, and Van der Haag publicly insulted Morelli a month ago and kicked him out of the house.'

'A very simple case it seems,' the Sûreté Chief said, turning to us. 'The motive for the crime is obvious, and the murderer was almost caught red-handed.'

'Obvious things are not always what they seem,' Levallois squeaked. 'Now that we *are* here — let us see if this case is really so banal.'

M. Laforce nodded and walked briskly towards the house, which was built in the Italian style with two belvedere towers. It was apparent that the studio at the rear had been added by the painter, for it fitted ill with the harmonious lines of the main dwelling. We were still some distance from the porch when Levallois sidled up to the Chief and pulled his sleeve.

'The brigadier said that Morelli was seen at the garden entrance, but there is a door by which one can enter the studio from the villa. May I request, monsieur, that we do not walk on valuable footprints, but pass the other way?'

Voltaire nudged my arm and whispered: 'François smells a mystery — splendid!'

The little man's keen ears caught the words; he turned sharply and exclaimed: 'Mais oui — I take nothing for granted. If our chief permits, you, Voltaire, will get a rope from the car and drive stakes into the ground in a wide circle; a gendarme must prevent anyone from passing.'

It was fortunate Levallois had acquired a reputation, for the unexpected request annoyed M. Laforce; he looked at the absurd figure in the raincoat with a frown, then, with a queer, resigned gesture, grumbled:

'Bien — you may do as you wish. I shall merely verify the main facts and return to Marseilles. We can do little to-night. A *juge d'instruction* will come tomorrow. See that you have a clear case for him.'

In the hall the son, Pierre Van der Haag, was waiting for us. He was a slim, handsome fellow, but curiously effeminate, with something catlike in his movements, purring, gentle voice, and oblique regard. He was quivering with emotion, and his haggard face twitched continually whilst answering the Sûreté Chief's perfunctory questions. I noticed, too, that he had a queer trick of pulling rhythmically at the lobes of his ears. His statement was curiously disjointed, with many querulous repetitions, although his voice did not rise above a monotonous, husky undertone.

'Dreadful — dreadful! I am all unstrung. Who could have foreseen such a hideous crime? Figure to yourself, monsieur. I left here at two o'clock and spent all the afternoon at my club. My father — my dear father — had expressed the wish to be alone — undisturbed. He was busy on a picture. I left him well and happy! I was sitting at the baccarat-table when a servant called me to the telephone. Dreadful! So unexpected! When mademoiselle told me what had happened I nearly fainted. Dead — my poor father was dead! It was that vindictive Italian, of course. He murdered ——'

'A lie, a foul lie!' a full, musical contralto broke in sonorously. I turned hurriedly and saw, framed in the door, a beautiful girl, not more than twenty. Her black, silken hair, olive skin, and flashing eyes made an unforgettable picture as with outstretched hand she pointed at Van der Haag. She was trembling with passion, and her voice had a guttural intonation I could not then define.

'You beast — how dare you accuse the man I love? Yes — the man I love! I will not be silent! That is why your father hated him, and you are plotting against him for the same reason. It was an evil day when my father gave his life to save yours and I allowed myself to be brought here.'

During this violent outburst the son had stood nervously tugging at his ear and devouring the girl's face. It was clear he loved her and equally apparent that she disliked him intensely. She was about to say more when Levallois shuffled silently forward and, peering up with a sympathetic expression, stroked her arm much as one would a dog.

'Calm yourself, mademoiselle!' he squeaked. 'I am here — the great Levallois — you have heard of me, hein? I will discover the truth; have no fear.' His grotesque manner and grandiloquent speech relieved the tension.

M. Laforce burst into a laugh, the son tittered, and even the girl — furious a moment before — smiled wistfully and sank into a chair.

'That's better,' Levallois continued. 'Now please let a servant conduct me to the studio, I wish to examine it. Monsieur Laforce has doubtless many questions to ask.'

He slipped out of the room with a significant glance at the brigadier and myself. A maid, summoned by Mademoiselle Collana, accompanied us to the rear of the house, where a gendarme stood on guard.

'Has anyone entered since the body was found?' Levallois asked sharply.

'Non, monsieur,' the officer replied, saluting. 'The young man and the lady tried to pass, but my orders were strict. The garden door is also guarded.'

Levallois nodded and, withdrawing the key, examined it with his lens. Then, without a word, he pulled at the door, which opened inwards. We found ourselves in a short passage ending in a second, heavily padded partition. I heard my friend chuckle as he pointed to it. 'Small wonder no one in the house heard the shot; that would effectually deaden any sound.' He turned the handle and switched on the light. The studio was a vast, lofty room with a square glass roof above a species of raised platform. To the left, against the wall, was a narrow couch with carved wooden back and upholstered ends; and on this, the face half-hidden in a cushion, lay a man. The shaggy, black hair and long beard were streaked with blood; blood had spurted over neck and shoulder, and at the base of the head was a bullet wound. It was the unfortunate painter! He had evidently worked at one of those desert scenes which had brought him fame, for near the couch, with bowed head and arms outflung in attitude of prayer, stood a lay figure garbed as an Arab. The ample burnous, the red leather boots, high turban, and dark-blue Tuareg veil, which covered all but the eyes, were so realistic that the thing might have been alive. A large canvas rested on an easel, and palette, colours, and brushes were scattered over an oaken bench. I noticed that there was also a tray with decanter and glasses on a Moorish table beside the couch.

Whilst Levallois stood in the doorway taking in the scene, Voltaire came and joined us.

'Well, François,' he growled, 'what do you think of our little problem? I've fenced off most of the grounds around here and placed gendarmes to watch. It seems to me a waste of time, though. I've talked to some of the neighbours. The painter assaulted Morelli a few weeks ago because he wanted to marry a girl Van der Haag adopted. Her name is Morbida Collana, and she is an orphan. Her father, who was Italian, married a Kabyle and settled in Tunis, where the girl was born. It seems the painter has lived much in Arabia, and he and Collana were great friends. Moreover, Van der Haag and his son were captured by Bedouins, I'm told, and the Italian rescued them and got a bullet through the lungs as they were riding off. He left his daughter plenty of money, but in obedience to her father's last wishes she came to France with Van der Haag. Rumour has it that he was in love with the girl himself and guarded her jealously.'

Levallois had stood listening to his friend's monologue with apparent indifference, his beady eyes roving from floor to ceiling. Suddenly he flung out his hand with dramatic gesture. 'Look — the murderer was most considerate — he has left muddy footprints on the carpet and dropped his pistol. What time did it rain, brigadier?'

'There was a heavy shower, monsieur, just before the crime was reported.'

'Yes — we had a blazing sun all day, but it rained between eight and ten, and the grounds are still sodden.'

He sidled into the room and dropped to the floor by the footprints, motioning us to remain by the door. Then abruptly his clumsy gait became swift and sure. With a deft movement he pulled off his boots and threw them into a corner and, as though rid of a burden, settled to his work with a sigh of relief. For an hour he crouched, ran, knelt, or wriggled over the floor with lens and lamp, scrutinizing, measuring, and testing every inch of the ground. Twice he halted and examined the body, but it was the lay figure and the canvas at which the painter had worked which seemed to draw him strangely.

'Brigadier,' he called shrilly, 'you have fought in Africa, come and look at this; take care — step on tiptoe. Now tell me — is the Bedouin head-dress right?'

Surprised at the unexpected question, the gendarme approached gingerly and examined the dark-blue cloth with its camel's-hair binding and drooping veil.

'Why, no, monsieur — now you mention it — a Tuareg folds it criss-cross and he does not use camel's hair. Moreover, this has been tied by someone in a great hurry. It's all awry.'

Levallois looked thoughtfully at the stark form on the couch.

'I thought so. He specialized in Bedouin portraits and desert scenes — and he spent many years in Arabia

— you said, Jules? Then he would have known better. You are sure ——' With a sudden pounce he seized the gendarme, and his eyes glittered. 'You are sure this figure was dressed so when you came in?'

The officer frowned and gazed perplexedly at Levallois.

'I — wait — of course our first thought was for the body; then the son came rushing in — frantic — and almost immediately the girl called us. She had brought Vallais the gardener, and I went out and talked to him — five minutes, perhaps. Yet it seemed to me that I caught a flutter of white as I returned, although the son was still kneeling and sobbing by his father. But, yes — something had moved. I had a transient feeling that this figure had altered. I couldn't say how — the dress, perhaps, or the pose.'

'Or perhaps it wasn't a lay figure that stood there when you first came in?'

The gendarme laughed foolishly.

'That's nonsense — you mean?'

'Well, with that blue veil to the eyes you'd see precious little of the wooden face. All right — you can go now; leave your men on duty and please tell Monsieur Laforce that we shall wait for daylight. Hold on — you saw the Italian — how was he dressed?'

'Shirt, trousers, and boots — one was unlaced.'

'Ah — were they muddy?'

'Yes — very muddy — and mud had splashed on his trousers — he obviously ran headlong through the puddles in the road.'

'Well, let your men remain with him. I may go there later.'

The moment the brigadier had withdrawn, Voltaire stepped up to his friend.

'Out with it, mon vieux, what have you seen? We are bursting with curiosity. What is this about the changed lay figure?'

Levallois puffed out his chest and thumped it triumphantly.

'Hein? I always see what your poor eyes miss — I — the greatest detective ——'

Voltaire grunted impatiently. 'Yes — yes — old friend, we know all that — but — to our muttons.'

'Well, then — this man has been dead *at least eight or nine hours!* He was shot early in the afternoon; probably when the chauffeur heard what he thought was a car back-firing. See, the blood is hard and dry, and *rigor mortis* is setting in; his arm is already stiff. Moreover, I fancy he was assassinated whilst in a drugged sleep. I tasted that cognac on the table; it contains opium; his pupils are mere pin-points, and the eyes are shut. When a man is instantly killed whilst under the influence of a powerful narcotic, his eyes frequently remain closed. Now we will suppose that the murderer came to the studio door from the garden; you see, once there were really two rooms, but the folding doors and partition have been taken away and replaced by a curtain, which you notice is gathered to the right; thus he would see Van der Haag stretched on the couch, but he could not be sure whether he was asleep.'

'Unless it was he drugged the spirit,' I interrupted.

Levallois blinked at me. 'Surely — unless it was he put the opium in the cognac. But no stranger could do that. Now look at those footprints! Notice anything, Jules? No? Well, they are dry — hard and dry! Why muddy footprints in the afternoon, when it did not rain? And if they had been made only this evening, they would surely still be moist. See how clear they are — too clear, in fact; sole and heel, nothing is missing. Voyons, a man bent on such an errand would walk on tiptoe. And they come — these footsteps — but they do not go. So unless the assassin removed his boots after killing the painter, he remained in the studio.'

'But that's absurd,' Voltaire broke in.

'No; there may be an explanation. Having fired the shot, the assassin may have lacked the courage to leave in broad daylight. Perhaps there were servants about; he may also have passed through the second door into the house, or simply hidden. So now we come to the lay figure.'

'What!' I cried. 'You think he dressed in burnous and veil and stood rigid, motionless?'

'Well, it's just a theory. You see, there are also faint, muddy traces where it stands; and look at the painting — evidently the artist had worked on it before lunch; but what was he painting? Not a Bedouin, but a woman in gauzy veils. The *ébauche* is crude, but that much can be seen.'

I turned to the canvas, and saw that Levallois was right. Some palms and a shrine were drawn in charcoal, but several clear brush-strokes had outlined a woman in green draperies, carrying a basket on her head. Whilst Voltaire and I examined the picture, trying to understand what grim mystery underlay this apparently simple case, Levallois was routing among the many heaps of costumes, dresses, and other artist's accessories. Suddenly he gave a prolonged screech, and we saw him examining a ball of green silk.

He came to us with gleaming eyes and unrolled the bundle.

'Here is the veil and ornamental head-dress that was on the figure; it was torn off hurriedly when the police came, stuffed under those clothes, and the burnous and turban put on in its place.'

'How do you know?' I asked.

For answer, Levallois pointed to a smear of paint on the silk, and held up the palette. A streak of the same colour ran from the centre to the edge.

'Besides,' our friend added, 'Van der Haag was painting such a dress, and he would not commit the mistake of winding camel's hair about a Tuareg's turban. Now, Voltaire, you go to Morelli's house and search it. Examine his clothes, and bring back the boots he was wearing. Ask no questions and answer none, but give me your impression of the man.'

When Voltaire had gone, Levallois went to the inner door and spoke to the gendarme. Then he sat down on the steps of the raised platform, propped his chin on both fists, and was soon lost in thought. Somewhere a church clock chimed midnight; tree frogs croaked intermittently, and from far away came the long hoot of a steamer signalling for a pilot. At the dismal sound my friend raised his head and looked long and searchingly at the motionless form of the painter. I saw his expression tense suddenly, and with a quick jerk he stooped and picked up the pistol which had lain unheeded where it fell.

'What fools we are!' he exclaimed angrily, withdrawing the loading-clip and ejecting the cartridge in the breech.

'I've examined it,' I remarked. 'Browning, Belgian-made, thirty-eight calibre, nickel bullets. Barrel smells of recent firing. Holds six cartridges, but now contains only five.'

'Quite right; so if the shot was fired here, the ejected case should be in the studio.' Again he went to the couch and examined the ghastly wound; then, lifting the head, he peered at the cushion. 'There are no signs of powder-burn and the entry is small; that shot came from a distance. Stand five or six yards away and hold the pistol in a line with my finger.'

I paced off the distance, and found that what he asked was impossible.

'You see!' Levallois cried shrilly; 'you can get the angle from a yard away, but from where you are you'd have to stand on a ladder. And the bullet came from a distance.'

'A tree in the garden,' I suggested.

'Then why the footsteps and the pistol in the room? It's a queer case. Go to the door now and tell me what you see, looking at the couch.'

With deft fingers he removed burnous and turban, threw the green veils he had found over the lay figure, and adjusted the jewelled head-dress, taking care not to move the arms or head. Then he sprang to the wall and switched off the light. The effect was startling. In the dim sheen from the glass roof it seemed to me that a woman, a desert woman, leaned anxiously forward with outstretched arms and watched the dead painter. Dimly I sensed that something monstrous had happened in that room, the outcome of a cunning scheme.

'My God!' I whispered as Levallois crept to my side. 'What does it mean?'

'Some devilish deep-laid plot, that's certain,' he replied with shaking voice. 'We must wait for daylight. Voltaire should return soon. I shall stay here — alone. Get some sleep, both of you. There are chairs outside. I'll call you shortly after dawn.'

Flashing my lamp at the floor to avoid stepping on the footprints, I passed into the house. Not for the world would I have shared my friend's vigil. Soon after, Voltaire joined me; he carried a pair of boots and a scrap of paper.

'I found this in Morelli's pocket,' he said, when I had given him an outline of our discoveries. 'He yelled and struggled furiously to get at me, so I fancy there is a message on it, although invisible. Better put it in your pocket; it'll wait till morning.'

It seemed but a minute later when someone shook me roughly. I opened my eyes, to find the sunshine streaming through the windows and Voltaire beside me with some coffee. I rose, stiff and cramped from the chairs on which I had slept, and gulped the steaming beverage.

'Come along,' my colleague said. 'François is in the garden — fishing. I don't think he rested at all.'

'Fishing?' I cried stupidly.

'Yes — there is a pond near by. He's caught some queer fish, too.'

I hurried after my friend into the spacious grounds. It was as he had said. Levallois, dressed only in drawers and singlet, was crouching on the edge of a small, artificial pond, a long stick in his hand. At our approach he turned with a jerk. His face was ghastly; moustache and imperial stuck out like the bristles on a badger, and mud and slime covered him from top to toe, but a flame of satisfaction gleamed and danced in his eyes.

'The tangle is worse than ever!' he screeched. 'I searched the room in vain all night for the cartridge-case. I've just been paddling along on the bottom of this pool. Nice and refreshing, too. And I found this ——'

His hand unclosed, and I saw a metal cylinder in the palm — it was an empty cartridge-case. Then, as abruptly, he turned and pointed to a pair of slime-covered boots. For a moment he enjoyed my stupid surprise, giggling the while like a schoolgirl.

'Those are the boots that made the muddy prints in the studio. They also belong to the Italian. Not quite the same shape as the pair Voltaire brought, but undoubtedly his; and this little cylinder lay in shallow water near the bank.'

Again a vague sense of the monstrous swept over me, but this time I held fast to a definite thought.

'Someone faked the evidence against Morelli, and the shot came from here!' I cried.

Levallois shook his head and straightened up. In the clear morning light he looked like an absurd, benevolent gnome, but tragedy was in his face as he said: 'I spent a terrible night — the dead man tramped up and down on my brain — he battled to make me understand, all to no purpose. But this morning I found a clue. I'll show you.'

Hanging his raincoat over his shoulders, he led us to the studio. I had not examined the half of the room near the garden door. Beautiful embroidered draperies, Chinese vases, and numerous guns, swords, and spears from the East decorated the walls, and in a niche sat a huge gilt Buddha, gazing stonily at nothing.

'Look — the nose of the Bodhisat is chipped!' Levallois squeaked.

I stared anxiously at my friend. Had he become mad?

'No — no!' he cried again — reading my thoughts, 'I'm not crazy — the nose is chipped. It's quite fresh — I found the fragments on the floor and a tinge of metal on the white surface.'

'The shot!' I gasped — for at last I read his meaning.

The Buddha was in line with the couch and projected an inch or so from its niche.

'Well done, mon vieux!' Voltaire exclaimed. 'So the shot was fired from here, and the pistol and footprints near the body were left as a blind.'

'Just that! Though why the criminal killed Van der Haag from a distance and yet wished to make us believe the shot was fired at close range is beyond me. However, I found traces of small, elegant shoes near the garden door. I followed them to the pool, and saw where something had been rubbed in the muddy bank. Obviously these boots. Why? Because only muddy footprints would show on the studio carpet. That had been ascertained in advance. The rain last night was a coincidence; a hundred-to-one chance. And had we not investigated at once, the fact that the mud had dried would not have mattered. I cannot explain why the cartridge-case was thrown into the pool instead of being dropped near the body, unless — unless the fatal shot did not come from this pistol at all, and it was fired at the water merely to dirty the barrel. You'll find it belongs to Morelli; but why was it not actually used for the murder? When we discover that, and why the Italian entered the garden last night, we shall have solved the mystery. Anyway, someone shot Van der Haag early in the afternoon, walked up to the body wearing Morelli's boots, dropped the pistol where we found it, removed the boots and flung them into the pool. The rest, as yet, is merely conjecture. Although I feel sure there is a connection between that lay figure and the Italian's visit and foolish flight.'

His words reminded me of the scrap of paper in my pocket. I drew a spirit-lamp, chemicals, and metal plate from my case and set to work. It was a half-sheet

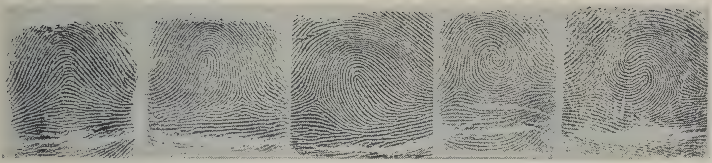

Fig. I. The five types of fingerprints

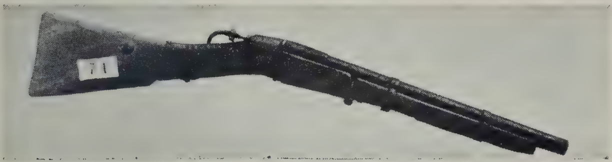

Fig. II. The old-fashioned gun that killed M. Van der Haag

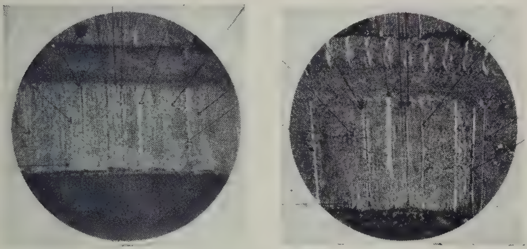

Fig. III (*Left*) Microphotograph of the bullet fired from the old-fashioned gun. (*Right*) Microphotograph showing rifling lines on bullet from automatic pistol

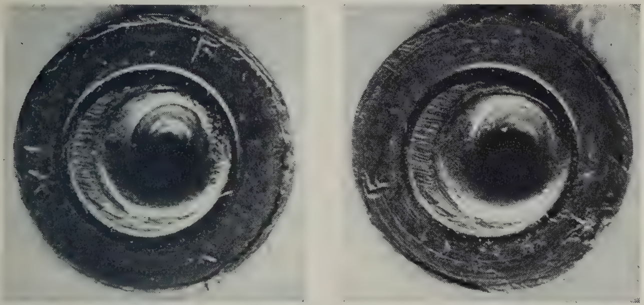

Fig. IV. Microphotographs of the cartridge case found in the pool (*left*) and of a test cartridge fired from the pistol (*right*)

FINGERPRINTS AND THE EVIDENCE IN THE VAN DER HAAG CASE

of linen paper, quite clean — but hardly had I applied iodine vapours when a line of writing appeared in rusty brown.

'Come to-night, ten o'clock; the gate is open. — M.,' Levallois read over my shoulder.

'H-m-m, so that's why he came — the girl evidently; her name is Morbida. But she loves him — or so I thought. What a tangle, and Laforce called it simple.'

'The *juge* will be here in an hour with the doctor,' Voltaire remarked. 'Then we'll see the bullet which killed the painter — eh?' for Levallois had grunted impatiently.

'The bullet went right through. I've got it,' he said, and fished a deformed projectile from his pocket. 'It was caught in the embroidered cover — come, we'll have another look at the couch.'

Together we carefully lifted the body and placed it on the floor. Then I removed the cushion on which the head had rested and examined it with my lenses.

'Is there a second hole in the couch?' I said quietly to my friend. 'Another bullet went through just beside the mark of the first, but the tear has been mended.' Voltaire felt over the upholstery. 'By God, yes; it's in the stuffing.' Eagerly he probed and pushed with a wire, and we heard something fall. Levallois tried to drag the couch aside.

'Why, the thing is a fixture!' he exclaimed, dropping flat on the ground and wriggling beneath it. A moment later he emerged and placed a nickel bullet in my hand. 'You'd never guess!' he cried. 'The couch has been screwed to the wall quite recently. I saw where it had stood before; the wall-paper is torn — ah-h.' He seized my arm and pointed a shaking finger at the Buddha; then, without a word, he carried a table to the wall, climbed up and pulled at a long, old-fashioned gun, one of the many trophies adorning the studio. 'It's held by steel clips — they are bright and clean — this is the gun which killed the painter. See, the barrel is in line with the Bodhisat and the divan!'

He fumbled at the breech, and held up a cartridge-case with a triumphant squeal. 'The same calibre as the pistol. This is one of those old-fashioned guns the Arabs favour, which will take revolver ammunition. Now, for Heaven's sake, tell me why the murderer went to this extraordinary trouble. He must have pulled the trigger by means of a wire or something, from the door. Gun and couch have been adjusted so that the shot should hit exactly where the head was resting. He tried it once to make sure, and then clamped the couch to the wall.'

'That explains the opium used to drug Van der Haag — but Morelli could never have done all that,' I cried.

'Either the girl or — the son,' Voltaire said grimly.

'The son was at his club all afternoon and evening,' I replied. 'He left the house at two o'clock, and the chauffeur drove him. The brigadier verified that. There remains only the girl. If she faked all those proofs against her sweetheart and purposely sent him that note, she must be a monster.'

At that moment a gendarme called to us that the *juge d'instruction* had arrived.

'Say nothing until I come,' Levallois cried. 'I'll wash and dress.'

Almost at once the door opened to admit the magistrate. We were fortunate, for much depends always on the methods a judge favours, and M. de Castellane was reputed a clever, discerning man, who appreciated subtleties. With him was a doctor from headquarters, who immediately began his examination of the body. The *juge* looked curiously at our dishevelled appearance.

'You have worked all night, I see,' he remarked with a smile. 'Although Laforce reported this to be a clear case; but, of course, Chief-Inspector Levallois ——'

'You will admit, monsieur,' a squeaky voice came from the door, 'that we were justified in working all night, when you have heard my report,' and our quaint colleague shuffled forward, looking more absurd than ever. He had wound a long scarf around his bald head, and his feet were shod with carpet-slippers, borrowed, probably, from a servant. The magistrate smiled resignedly and sank into a chair.

'I am ready to listen, monsieur.'

In short, concise sentences Levallois sketched an outline of his investigation — omitting only the discovery of the gun and the chipped nose of the Bodhisat. I saw the magistrate's face harden as the various details became clear. When Levallois had concluded, he turned to the doctor, who stood waiting.

'What is your opinion, monsieur?'

'The man has been dead at least twenty hours. He was shot from a distance whilst in a drugged sleep, and the assassin must have stood on a chair. Death was instantaneous. For the rest a *post-mortem* is necessary.'

M. de Castellane nodded. 'Then please have the body removed to the laboratory at once.'

When the doctor had gone with the stretcher-bearers, he turned again to us.

'I have sent for Morelli. I shall question him in your presence. Have you any suggestions to make?'

Levallois flushed at the unwonted courtesy. 'But, yes, since you are so kind, monsieur; I believe he will confess to the killing. He ——'

'Good Heavens! What makes you so sure?'

'He believes the girl shot Van der Haag, and he will try to save her by taking the blame.'

'You think he saw her commit the crime?'

'No — for the painter died about three in the afternoon, whereas Morelli came at ten. The studio was flooded with moonlight then. The door was open, he looked in and saw the blood-stained face on the couch — the pistol gleaming on the floor — and a figure dressed in Oriental draperies, which he recognized, bending over the body. I hear the girl often wore such clothes ——'

This time the fleeting oppression of a horrible plot crystallized. At last I grasped the meaning of the hurriedly dressed dummy; so did the *juge*.

'By God — I believe you are right,' he cried. 'At the moment he was about to enter, the gardener probably appeared, and Morelli ran blindly across the lawn, intent only on giving his sweetheart time to escape; perhaps he purposely allowed himself to be recognized. But who — who is the murderer?'

'I can guess — but I must have time — one or two days more, monsieur.'

The door opened and Morelli, haggard, livid, with bloodshot eyes, came in, followed by two gendarmes. I at once placed a chair for him so that the light fell full on his face, and settled myself beside the *juge* in the shadows, whilst Voltaire placed a table before him. For several minutes M. de Castellane studied the prisoner intently, then he said: 'This interrogation is informal; no notes will be taken; so please tell the truth. You killed Monsieur Van der Haag?'

'Yes,' came the low answer. 'We quarrelled, and in a fit of rage I shot him.'

'With this pistol — it is yours?' and he laid the weapon on the table.

At the sight the Italian shivered. 'Yes — with that — it is mine.'

'How far were you from the man when you fired?'

The abrupt question caused the man to start. 'I — I don't remember — quite close.'

'You were both standing?'

'No; he was sitting on the couch, and he fell back dead.'

'What time was this?'

'About ten — the gardener nearly caught me as I fled.'

The magistrate glanced at Levallois with a queer expression, and I saw my friend shake his head. Thereupon M. de Castellane beckoned the gendarmes and ordered the prisoner to be taken back to his house and closely guarded pending further orders. The magistrate rose at once and, handing Levallois his private telephone number, hurried away.

Levallois stretched himself with a tired yawn. 'I shall sleep for two hours,' he said. 'I am worn out. Meanwhile, will you make micro-photographs of the two bullets we found and compare them with others fired from that pistol? I'll be here waiting — no one shall enter the studio until I have solved the riddle.'

As we climbed into the Fiat, Mademoiselle Collana rushed to us with outflung arms.

'Oh, I beseech you, tell me what have you discovered! My Carlo is arrested — yes? He is innocent, I know it — he would not hurt a soul.'

I looked at this beautiful creature in disgust — her voice, her gestures, were perfect, and, had I not assisted at the investigation, I should have been utterly deceived.

'Why did you write to Signor Morelli?' I asked, instead of answering her dramatic outburst. 'Why did you make a tryst for last night?'

I saw her eyes dilate with sudden fear and horror, and she shrank back a pace.

'I did not — I made no tryst,' she cried, and clutched at my sleeve as Voltaire released the brake. 'You are cruel — do you not see I am crazed with grief?' Then, as the car started, she sank sobbing to the ground and buried her face in her hands.

It was long past noon when, assisted by Voltaire, I had completed my experiments, and after a hasty meal we drove to the tragic villa.

The house appeared deserted by all but the police. In the studio Levallois was busy writing a résumé of his impressions. He looked up questioningly as we entered, and I handed him a sheaf of enlargements. 'The marks on the two bullets are entirely different from those I fired at a dummy with this weapon,' I said, 'but the cartridge-case found in the pond came from the pistol. I have brought a double microscope, just in case.'

Levallois rose briskly. 'Then let us fire that gun, also, and examine the projectile. It is nearly three o'clock, curiously enough; that is when I think the painter was killed.'

He climbed up to the gun on the wall and slipped one of the revolver cartridges into the old-fashioned breech, which opened by means of a slide pulling outwards.

'This thing is fixed by three clips to the wall. One on the barrel and on the stock, and one screwed to the trigger-guard. I wonder ——' A wild yell completed the sentence and Levallois came tumbling to the ground. He sat up and looked at a blistered hand a second; then he scrambled to his feet, ran across the room, his eyes seeking something we could not see, and, finally, with a shrill, triumphant scream, he dragged us both to the raised platform and placed his watch on the ground.

'Five minutes more. Oh, the fiend, the fiend! Who would have dreamed of such a trick? No wonder his alibi was perfect. Watch the gun!'

With pounding hearts we stood motionless — I think we all knew instinctively what to expect. Suddenly a dull, muffled report broke the silence, a wisp of blue smoke drifted across the sunlight streaming through the window, and a thud from the couch indicated where the bullet had pierced the cushion.

'What is it, then?' Voltaire asked in a dry, rasping voice.

'Thermic! That crystal — a beautiful Eastern sorcerer's crystal — on the shelf, collects the sun's rays at a certain hour and directs them on the clip against the trigger. A burning-glass, in other words. The metal dilates — I saw it was wedge-shaped, and the pressure fires the gun. Had it been a cloudy day we should never — after him — quick!'

We whirled just in time to see a white, evil face withdrawn from the curtain before the inner door; a key grated as we threw our weight against it. Wasting no time, we ran frantically across the lawn to the gates, but a fierce roar passing quickly to a throbbing drone told us we were too late. In the house we found the girl staring fearfully at a smashed telephone on the floor. Gendarmes were sent in haste to circulate a description of the car we had seen on the path when we arrived.

Levallois danced in helpless rage.

'So it was parricide?' I queried, trying to calm him.

'Of course!' he shrieked. 'I suspected the son from the first. His alibi was too glib, and he was the only one in the studio when the gendarme questioned the gardener. That's when he whisked off the veils from the lay figure and dressed it in burnous and turban. His one mistake, for the picture on the easel was of a girl. His guilty conscience, I suppose. And he got away ——'

'I can help you,' the girl interrupted, her deep contralto vibrant with joy. 'I knew my Carlo did not do it. That beast Pierre has a schooner in a cove on the road to Cassis; he will make for that, I am sure.'

'But we need a car ——?' Voltaire cried.

'Monsieur Morelli has a big Daimler — come — it's close by. But I must see him, you will permit it?'

Panting, breathless, and bathed in perspiration, we sped after the girl. Ten minutes later we scrambled into the automobile and Levallois grasped the wheel.

'She is coming to guide us,' he squeaked; 'it will save time — ah, there she is, poor soul. Mademoiselle, I congratulate you; Signor Morelli is a hero. It was to save you that he confessed to a crime he ——'

'Yes — he told me — but hurry now, please. To prove it we must capture that monster.'

A jerk, a roar, and we whirled out onto the road and down the steep incline to the coast. Already police were watching at every bend, but their signals informed us that Pierre Van der Haag had not been seen, and when we reached the tiny bay he used as a harbour, we perceived the schooner swinging lazily at her moorings. Levallois ran our Daimler into a belt of trees and climbed out.

'We command the beach and path from here,' he said grimly. 'If he does not come before dusk, I shall swim out and hide on board. We can't risk his getting away in the dark.'

There was nothing to do but wait, and whilst we lay hidden by the undergrowth, Mademoiselle Collano related that shortly after the painter had driven Morelli out of the house, a fierce quarrel had taken place between father and son. Hearing her name repeatedly mentioned, she had concealed herself behind a curtain just as Pierre pulled open the inner door, and thus caught the painter's last words.

'I am going to marry Morbida!' he had shouted. 'You paper-faced sneak, if I catch you making eyes at her I'll throw you out neck and crop. One move from you and Morbida shall know of your unhappy wife in Paris. Yes, that makes you squirm. To begin with, I'll alter my will.' Thereupon Pierre had stumbled from the studio with the face of a fiend, and from that day he had sought to win Morelli's friendship, although she had warned her lover that the boy was not to be trusted. She further related that Van der Haag constantly indulged in cognac with opium.

Levallois nodded thoughtfuly. 'That explains why the son was so sure the bullet would do its work. The painter was probably in the habit of sleeping off the effects of the drug on that couch. Pierre probably stole your sweetheart's boots and pistol and he wrote that note — you corresponded with invisible ink?'

The girl nodded. 'I was watched day and night. How he discovered the secret I cannot say. He is very cunning.'

'Yes, and he hoped the dress on the dummy would cause Signor Morelli to enter the studio and perhaps be caught standing by the body. Now be silent, please; he may creep to the beach unnoticed. He has not been caught as yet, or the police would have informed us of it.'

Slowly the hours dragged by; the sun sank towards the horizon, bats flitted overhead, and the frogs began their incessant croaking.

At last Levallois rose. 'Flash your lamp twice if the police come,' he said sharply. 'A pistol shot if he walks into our trap — I'm going to hide on the boat.'

I watched the little fellow scramble down to the beach and wade into the shimmering water. Hardly had he begun to swim when two shots came in quick succession from a porthole; a motor suddenly roared into life, the propeller churned the sea to foam, and, quickly gathering speed, the schooner disappeared into the night. Pierre Van der Haag had been skulking on board waiting for darkness and had slipped away under our noses.

Dripping, discouraged, and quivering with rage, Levallois drove us to headquarters.

Revenue cutters searched the Mediterranean for days; telegraph and telephone carried our warning from town to town; but neither the cunning criminal nor the boat was ever seen again.

A month later Carlo Morelli and Mademoiselle Collana were married, and Levallois was the first to wish them luck as they drove away.

CHAPTER IV

THE MINUTIÆ OF SCIENTIFIC DETECTION

WEAPONS — CRIMES OF VIOLENCE — MURDERS

WITH the facilities for rapid flight which railways, motor-cars, and aeroplanes offer the criminal to-day, not only frauds, but even crimes of reckless brutality, are becoming more and more international. It is necessary, therefore, for the expert to be able to determine at once the probable nationality of a malefactor by the method, the instruments, or the weapon employed. Even England has now to reckon with the teeming foreign population of its principal towns, and the criminal organizations or isolated malefactors which are their inevitable appendage. Thus the first care of the expert when a murder, a burglary, or a robbery with violence has been committed is to analyse the method employed in order to learn whether the criminal is a foreigner or not. It is a curious fact that even if, for reasons best known to himself, a crook has decided to migrate, to carry on his nefarious profession abroad, he does not easily cast off firmly rooted habits. America has to deal chiefly with Mexicans, Negroes, Italians, and Russians; and in France, since the War, the native product — the apache — has been superseded by Polish, Belgian, Spanish, and Arab criminals. Each and all have their distinctive and easily recognizable tricks.

The French footpad has not the Anglo-Saxon's skill in the use of his hands. He is fistless, and rarely acquires the efficient hook to the chin or the jarring, straight blow which knocks a victim senseless for ten minutes. In

England and America, yeggs, or robbers who waylay solitary pedestrians, prefer their fists to a weapon. But there are many specialists among French malefactors, and their predilection for certain modes of attack has made it possible to subdivide them into classes. The real apache, whose haunts are limited to well-defined districts, is an expert in the use of the neckcloth, a trick picturesquely named '*le coup du père François*.'

While a confederate approaches the victim and politely asks for a match, the operator throws a scarf over his head from behind. Without letting go, he twists round, with the ends over his shoulder, and, pulling downwards, bends low, so that the unfortunate victim is lifted from the ground by the cloth around his throat. The accomplice then makes a search of his pockets. The apache is also an adept at suddenly butting unsuspicious pedestrians in the stomach with his head; a terrible form of attack, and difficult to parry. The footpads whose headquarters are at La Villette, which corresponds to London's Smithfield, use a mutton bone, a fearful weapon, which has the advantage of being easily obtained, and which is quite devoid of individuality, retains no finger-prints, and only exceptionally betrays the owner. The flat end of a sheep's shoulder-bone is grasped in the hand, the short, jagged end protruding between the second and third finger. A straight punch below the belt with this is often fatal, and always renders the victim helpless while his pockets are emptied. The knife is no longer the favourite weapon of the apache, but, when used, the shape of the wound and the manner in which it was inflicted are valuable indications to the police. The apache knife — in French argot *lingue* — has a ring at the back of the lock-blade, and the point is curved. The criminal always slashes upwards with it,

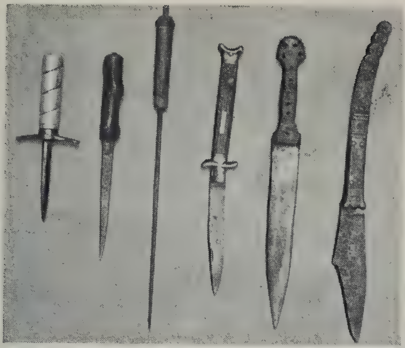

Fig. I. Knives used by different nationalities

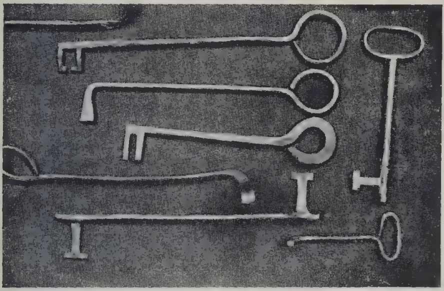

Fig. II. A collection of rough but efficient skeleton keys

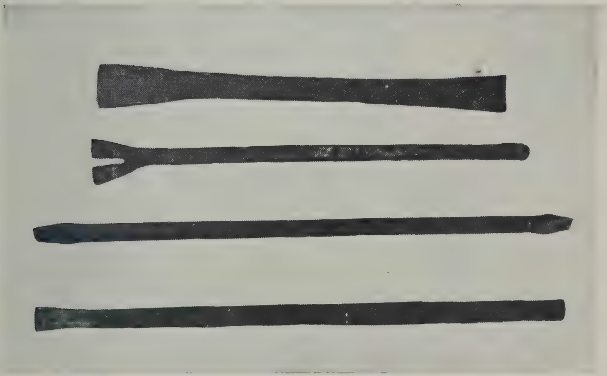

Fig. III. Types of burglar tools

WEAPONS AND TOOLS OF CRIMINALS

ripping, rather than stabbing. The Italian and Corsican dagger is made to strike downwards. The blade of the *lingue* is generally short and broad, whereas the stiletto is long and slender. When the assailant is a man who began life as a mechanic, electrician, mason, or carpenter, he frequently makes his own weapon, for he well knows that he would easily be traced if he were foolish enough to buy one in a shop. The police museums have an infinite variety of these home-made arms. A very terrible instrument was discovered recently on the scene of a murder. It was a piece of electric cable, with a lump of lead at the end. In this instance the murderer was traced by the cable, which was manufactured only by the firm where he was employed for odd jobs.

A piece of rope, with a lead weight attached, led the police to a young surveyor, who had found the plumb-line of his trade an efficient means for stunning those he wished to rob. A very strange weapon was discovered by the police some years ago. This was composed of a stout piece of wood, to which two horseshoes had been nailed. A man was found lying dead in a stable, and the investigating officer at first believed that he had been kicked by a horse. The marks where the hoofs had crushed his skull were plainly visible. Only the murderer had struck downwards with his horseshoe club, whereas a horse kicks upwards. This oversight led to his capture.

The English footpad does not often use a pistol. It is too noisy, and ammunition is not easily obtained; nor does the French apache favour firearms — the Bonnot gang were exceptions; but Poles, Russians, and the Nervi of Marseilles prefer this weapon to any other. Furthermore, they have a *penchant* for automatics of great precision and penetrating power, such as Mausers or Brownings. The Corsican prefers the Parabellum.

Since all these firearms leave characteristic wounds, the probable nationality of the criminal is thus quickly ascertained. In the United States it is the Colt forty-five, or the sawed-off shotgun, which is generally employed by Anglo-Saxon criminals. The knuckle-duster and life-preserver are also much used, and, since the American malefactor frequently operates in England and France since the War, this preference has been carefully noted by the police.

The razor is, of course, the weapon of the Negro; and Spaniards and Mexicans still cling to the use of the old-fashioned revolver or the broad-bladed throwing-knife. Thus the appearance of a wound, although it does not at once lead to the assailant, at least helps the experts to eliminate those habitual criminals who would not be likely to employ the weapon which inflicted it. This facilitates their search by giving them a starting-point.

Some time ago a really ingenious method for rendering victims helpless was discovered in Barcelona. Almost every night men were found lying unconscious near the statue of Columbus, robbed of money and valuables. Strangely enough, they were unhurt, except for a small bruise on the point of the chin. Their tale was always the same. When passing one of the many narrow streets leading to the harbour, something clinging, yet elastic, that felt like a net, had suddenly fallen over their heads and pinioned their arms, and before they realized what had happened, they had lost consciousness. This curious description led the chief of police to believe that a net was actually being used by a skilled hand in the manner of the Roman gladiators. A net at once suggested fishermen, and a number of detectives were ordered to watch the Catalonian fishers. It was thus discovered that the two sons of an honest old seaman had prepared a net so that it could be thrown from a short distance and instantly pulled tight. Of course the man thus snared was quite unable to struggle, and before he could cry out a sharp blow with a rubber stick on the point of the chin knocked him senseless.

Hammers, hatchets, sharpened triangular files, and other tools of a former trade are much favoured, but nearly always lead to the detection of the criminal, because the wounds they inflict are so characteristic that the expert at once knows the kind of weapon he must search for, even if it has not been abandoned on the scene of the crime or thrown away by the assailant in his flight, and, once the weapon has been identified, the criminal is quickly found.

Perhaps the strangest of all home-made instruments ever discovered was a species of net made of coarse ropes, which contained a huge stone. The thing was reminiscent of the Stone Age. It was found near the body of a farmer, who had obviously been attacked whilst ploughing. Since there appeared to be no motive for the crime, the queer weapon and the evident strength and ferocity displayed by the murderer led the experts to believe that the assailant was either a savage from some distant country or a madman. A patient investigation brought to light the fact that a nearly nude Negro, of gigantic stature, had been perceived several times lurking in the extensive forest of Compiègne. He was captured after days of ceaseless search, and turned out to be a Patagonian who had been touring France with a showman, but had unexpectedly escaped.

Many stories have been written about robberies committed by means of narcotics. Most of these are purely imaginary, and, although picturesque and exciting, are based on absolute fallacies. It is generally believed that hotel thieves sometimes use a syringe to squirt ether or chloroform into a bedroom through the keyhole, and, when the occupant is unconscious, enter and rob him. There is also the belief that chloroform has been used in trains to stupefy a sleeping traveller, either by saturating the air in the compartment with the anæsthetic or by placing a pad of cotton-wool soaked in chloroform over the traveller's nose and mouth. Hoffmann, Dolbeau, Lacassagne, and other medical experts have proved by innumerable experiments that such a method is quite impracticable. To begin with, chloroform and ether are so volatile that, in order to saturate the air sufficiently to render a person unconscious, gallons of the drug would be needed. Furthermore, the pungent and characteristic odour of the anæsthetic would alarm not only the intended victim, but everyone within a wide radius. But, setting aside these two obstacles, it has been ascertained that the effect of chloroform or ether on a sleeping man is to awaken him instantly. Nor is the pad over nose and mouth more efficacious. Anyone who has assisted at the administration of an anæsthetic in a hospital knows how furiously the patient struggles, and that often a long time elapses before he becomes unconscious. Drugged cigarettes or cigars are also to be classified as fiction. There are, nevertheless, several methods for doping victims, frequently and successfully used by women. They take care, however, first to ply their victim with drink, then, when his senses are dulled, chloral, opium, or one of the veronal derivatives is mixed with a stiff glass of spirits. These cases are fortunately rare.

The hypodermic syringe is sometimes used by criminals abroad, but, again, it can be successfully employed only on an intoxicated person, since the prick of the needle is sufficiently painful to prevent it from passing unnoticed; furthermore, to obtain an immediate effect, the injection must be intravenous, and few criminals have the necessary anatomical knowledge for this, nor is it feasible to locate a vein if the victim is clothed.

There was a case, however, not long ago in Germany where persons were rendered unconscious, or even killed from a distance, by means of a deadly gas. No doubt the use of gas during the War suggested it. The method was extremely ingenious, and worth describing, although, for obvious reasons, I cannot reveal the nature of the poison used. It was, however, so toxic that a minute quantity entering the lungs was sufficient to prove fatal.

One morning a policeman going his rounds was startled to see a woman lying before the door of a house in a fashionable neighbourhood. She was dead, and her open handbag empty. Yet a superficial examination failed to disclose any signs of foul play. Four other people were found under similar conditions during the course of the week. Fortunately one of these — a young man — was only unconscious, and recovered. Meanwhile the medical experts had discovered traces of arsenic in the lungs of the other victims. The young man was questioned, and related that, when returning home shortly before midnight, he suddenly perceived a man step from a doorway a few paces away, and raise his hand. From that moment he remembered nothing more until he saw the doctor bending over him at the hospital. Two more cases occurred in the same neighbourhood. The matter was hushed up as much as possible, and numerous detectives ordered to watch the district. Several weeks passed, and nothing further happened, and the police were at their wits' end. None of the stolen property could be traced, nor could any of the army of informers supply information. Then abruptly a wealthy Russian was found lying dead outside his mansion. Again the doctors found traces of poison in the lungs, and the expert investigators were convinced that death had been instantaneous. The victim had been robbed of a large amount in bank-notes, but all efforts to trace these were unavailing. No clue of any kind was found beyond some minute fragments of glass. These were submitted to a noted chemist, who declared that the splinters came from a thin glass bulb which had contained a deadly gas.

Then, quite unexpectedly, a woman informed the police that she had a tenant, a young Russian doctor, who had fled from the Soviet terror. He was very poor when he first came to her, and several times had been unable to pay his rent. Lately, however, he had settled his debts, and she had noticed that his wallet was filled with notes of large denomination. Furthermore, he had expressed his intention of moving to a sumptuous flat in the West End. This had aroused her suspicions, for he spent his days experimenting with strange appliances, and sallied forth only at night. A very clever detective was sent to take a room near this mysterious doctor. Several days elapsed, and the officer reported that he believed the doctor was the unknown assassin, but that no definite proof was as yet available. In vain the police waited for a further report; the detective had disappeared. He was found lying in some bushes in the famous park, the Thiergarten, by a cyclist, and again the mysterious poison had killed him. Determined to risk a scandal if they were mistaken, the police forced their way into the doctor's room. At their unexpected appearance the Russian, who was busy with crucibles and retorts near a window, snatched up some shining glass balls lying on the table, and threw them at the police. Only one man escaped alive. He related that these balls — as big as oranges — appeared to burst when they struck his colleagues, whereupon they collapsed as though struck by lightning. Only by ducking and running down the passage with hands tightly pressed over mouth and nose had he been able to escape. In response to his telephone message, police were rushed in lorries to the house, which was at once surrounded. Then a squad of detectives wearing gas-masks entered the room. They found their colleagues lying in a heap, and quite dead, and near the window was the doctor, fragments of one of the glass bulbs still clutched in his hand. It was ascertained, although none remained, that he had blown these ingenious missiles himself, and filled them with a volatile poison as deadly as cyanic acid. He had apparently waited hidden in a doorway until the victim he had chosen approached, whereupon he would throw the bulb at his breast. The impact naturally caused the glass to burst, and the poison rising to the face instantly produced death. It was fortunate the police acted when they did, for they found a species of pneumatic pistol on the table at which the Russian had been working, which was undoubtedly destined to propel smaller glass projectiles of similar potency. Happily few criminals possess the skill and knowledge necessary to manufacture such a fearful weapon. The instrument is now in the police museum.

The queer case of the murder at the Villa Bella-Vista is typical of the importance that details, formerly overlooked by detectives, may acquire when examined, as they should be, by scientists. Only a few of the countless methods evolved in the laboratory were applied, however, the chief of which was the identification of the bullets and firearms. Each phase of an investigation would require, not a chapter, but a volume, to describe it fully. The object of this book is to give merely a rough but comprehensive outline, and the adaptation of the various branches the investigator must study is best illustrated by actual instances where they played a predominant part. Thus I must omit many technical explanations. Nevertheless, I hope that the broad basic elements will emerge sufficiently to give the reader a bird's-eye view of criminal investigation.

Although it is necessary to combat criminals in all the phases of their ceaseless warfare against the community, the experts have naturally devoted more of their time to the systematic detection of the three most dangerous offences — burglary, forgery, and murder — than to any other; and of these three, homicides rank first, since life is more precious than property. The word *homicide* must be taken generically as including all forms of killing with malice and intention, even if that intention was conceived only an instant before the deed. Although the law in many countries distinguishes between the various types of homicide when inflicting punishment, in England all killing is murder, unless it be proved later that there were circumstances by which the accused may benefit, transforming the killing to accidental homicide or manslaughter.

The methods of the murderer are not so varied as one might be led to believe, and they have been divided into constantly recurring types. Although never exactly similar in detail, broad fundamental principles can be applied to all. Premeditated murders for gain, revenge, or sex motives predominate. Then come the homicides committed on sudden impulse, such as the shooting of a constable, detective, or caretaker of a building by a thief surprised at his work, who kills only to escape; and the murders due to an irresistible fit of rage or momentary snapping of mental balances. There are exceptions, of course. But these exceptions, such as the crimes of Jack the Ripper, are generally a manifestation of sex perversion or homicidal mania.

The instant identification of a crime, with its classification as a recognized type, is very important; it is, indeed, the basis of scientific detection. As in algebra, the unknown x is reached by a simple formula, for which only one or two known factors are needful. Although this principle is fairly obvious, the layman knows little of the true *modus operandi* when a crime is discovered. Detective fiction, with its fantastic and laboured clues, is largely responsible for this; yet it would help the investigators greatly, and the criminal not at all, if everyone knew exactly what are the important details of which the police should be informed at once, and how essential clues may be unwittingly destroyed. The murderer is never master of the situation to such an extent that he can avoid leaving traces that to the expert are merely so many sections of a puzzle, which he is accustomed to fit together. It is impossible to take a human life without fashioning a broad trail, and this knowledge should be the greatest deterrent to criminals.

The scientific investigator does not search for these traces at haphazard. They have been carefully classified, and tables of frequency established, based upon the observations of criminologists in every country. I can cite only those which may be termed fundamental and constant. Finger-prints I have already described. These are nearly always discovered on the scene of a crime. The popular belief that criminals take the precaution of wearing gloves is a fallacy. Few people can realize what a fearful thing assassination is, and how abnormal even the most brutish man must be during those terrible minutes when he is destroying a fellow-creature. His heart is pounding, and his lungs gasping for breath, as though he had run a race. Every nerve is twitching, and the hands almost refuse to obey the brain. Coherent thought is impossible, and fear — the primeval fear of the hunted beast — has displaced the power to reason calmly. Now imagine such a man struggling to open a safe, doors, drawers, or attempting to efface the traces of his act, to tie knots, or any of the possible contingencies which may arise, hampered by gloves. Almost inevitably, even though he intended to wear them, he will tear these off. A man who can resist this impulse and complete his dreadful work with gloved hands must be, indeed, a hardened professional, with exceptional strength of mind. Thus, when the experts investigate a crime, and find that the fingers were protected by rubber or leather, they have at once an invaluable clue to the personality of the malefactor. He is unquestionably an habitual criminal, or a man endowed with extraordinary *sang-froid* and will-power. Therefore the very absence of the telltale finger-prints narrows the field of research.

It has been established, for instance, that a professional criminal, who has killed more than once, will choose carefully the spot at which he knows from experience that a single knife thrust or bullet will be sufficient. He strives to proceed in a workmanlike manner. Efficient and careful, he knows that to sever an artery will cause the blood to spurt over him and stain his clothes; experience has taught him that a victim who is not instantly killed may struggle and clutch at his clothes, and that a shred of cloth or a button left behind can become vital clues. He takes a certain pride, too, in 'doing the job' neatly. The youngster or the novice, on the other hand, is seized with a frenzy, the outcome of horror, and will hack and stab long after his victim is dead, fearful lest an unexpected movement of the body should recall its humanity. This knowledge served the Sûreté when they examined M. Rémy.

'A youngster has done this,' the detective at once exclaimed. 'Twenty stabs, and not one reached the vitals. Loss of blood caused death.'

No signs of an entry from outside were discovered. In the house were only the butler, a middle-aged man, and a lad of nineteen, named Courtois. He was immediately suspected, and finally confessed.

Thus it may truly be said that nothing is too small to escape the observant eye of the modern scientific investigator, and since memory is at best unreliable, detailed reports, illustrated by numerous photographs, are made of all that is discovered, and placed at the disposal of the police, who can thus at any moment consult the pictures and description of the room where a crime was committed, of the streets leading to the house, the wall surrounding the garden, and the furniture and its position relative to the body, so that when interrogating a suspected person they can at once detect a contradiction or a discrepancy in his statement. Scientific investigation to-day has become a study of the minute. I might almost call it a study of the invisible. Indeed, this is true in many instances. Fingerprints are invisible until they are revealed by powdered white lead. Footprints are often mere shapeless impressions until plaster casts are taken; traces of poison do not become tangible to a jury until micrographs are submitted to them; and blood-stains are meaningless until the expert demonstrates the difference between blood which has spurted from a knife or a bullet wound, and the variation in splashes, according to whether the victim was struggling, walking, running, or lying on the ground. Indeed, it is the task of the scientist to refute the arguments of the prisoner and his counsel by facts. Inferences and deductions, when not supported by tangible evidence, are becoming things of the past. Always must it be remembered that the expert does not strive only to enmesh a criminal: his ambition is to forge an unbreakable chain of proofs, and his ideal is — truth! And if his profound knowledge causes the guilty wretch to cower and tremble, it must also bring comfort to the innocent man or woman who happens to be arrested on suspicion.

Scientific investigation will eventually supersede the barbarous system of relying on the evidence of witnesses and informers, and thus finally a miscarriage of justice will become impossible. Circumstantial evidence has ruined many lives, and should ever be deemed insufficient. Modern methods would have spared Oscar Slater a lifetime of hideous suffering.

It must not be thought, however, that the laboratory expert despises logical deductions or psychology. But these are only the lamps which illuminate his edifice of dovetailed proofs. Perhaps I can best demonstrate this by describing step by step the procedure in several recent cases.

The police at Marly, near Paris, were informed one day that cries had been heard during the night proceeding from a house inhabited by a lady and her elderly servant. The officer in charge at the police station entered the house, and discovered a woman lying on the floor in a bedroom, dressed only in a nightgown. It was the mistress, and she had been stabbed. The officer at once summoned a doctor, but both he and the qractitioner were careful, since life was extinct, not to move the body, nor did they touch anything. A crime had obviously been committed, and the laboratory expert was sent for at once. This is the ideal procedure, but only lately has it become generalized. The first question was, How did the assassin enter? In this case the house stood in a garden, surrounded by a high wall, protected by a fringe of broken glass. The gate had not been forced; therefore, unless he possessed a key, only two means of access remained, either the gate was opened by the woman or the servant, or the murderer scaled the wall. If the latter, he probably threw a coat over the jagged glass to protect his hands; therefore the sharp points were searched for microscopic shreds of cloth which would naturally adhere to them. None were found, nor were there traces on the wall showing where he climbed up, nor any sign of the deep footprints usually discovered when a man has dropped from a wall to the ground. Such footprints often reveal whether the assassin was light, heavy, agile, or clumsy, an indication which helps the expert to determine whether he was an amateur or a professional criminal. Since there were none, nor any marks on the gate, someone had opened it from the inside.

It remained to discover how he entered the house. Skeleton keys, levers, or chisels leave characteristic marks which even reveal the probable strength of the man. Or if a window has been smashed, the method employed, the use of fly-paper to prevent fragments from falling, and the use of a diamond show that the assassin knew whether he dared make a noise or not and therefore whether he had obtained information regarding the habits of the inmates. In the present case a lever had been used on the door. The marks were carefully measured and photographed. Their depth and shape proved that admittance could not have been gained by their help. They were made only in order to simulate a forced entry, and the door had been opened or left open by someone in the house. Thus already a definite line of investigation was emerging from chaos.

The room of the tragedy was then visited, and photographs taken by means of measured screens which gave the correct size of the room and the relative position of furniture and body. Every object in the bedroom was at once inventoried. On the table stood a decanter and four glasses. At first sight it appeared that four people had caroused there, before or after the crime. It was, however, seen immediately that the finger-prints on the glasses and the decanter were those of only two people, and an examination of the dead woman's hands proved her to have been one of them. The microscope disclosed marks of saliva and spirit on the inside and outside edge, on the rims of two glasses, and furthermore the characteristic smears of a moustache on one of them. The other two contained traces of spirit *unmixed with water* — and had not been used to drink from. Obviously either the mistress or the servant opened the gate and the door to admit the man, who may have come as a friend. The soles of the victim's shoes were scraped and minute particles of sand from the garden found adhering to them. This did not prove that she opened the gate, for she may have walked in the garden for other reasons, but it was a possible solution.

It had already been ascertained that the servant had disappeared, although she was seen in the garden on the preceding evening by neighbours. An officer was at once sent to make inquiries in the district, whilst the experts proceeded to examine the body. It became apparent immediately that the woman was not killed at the spot where she was found. The cover on the bed was neatly arranged, but upon turning back the sheet, a blood-stain was found which had soaked through to the mattress. Drops of blood had spattered in a line to the edge of the bed and crossed the floor to the wall near the window. These had the well-known appearance of blood spurting from a wound while the victim is running. On the wall were three crimson finger-marks, sliding downwards, and a smudge of blood on the ground just underneath. It now became possible to reconstruct the tragedy.

The victim had partaken of a glass of spirit and then retired. The man — a friend or lover of the servant — had been admitted by her. He had entered and stabbed the mistress just below the heart. She had succeeded in rising from the bed and ran or stumbled across the room with the intention of opening the window to call for help, but collapsed before she could do so. Thereupon the murderer had fetched the other glasses and drunk some spirit from one to make it appear that the victim and several men had made merry together. In order to complete the scene, he had arranged the bed and carried the body to the table. The mark of a broad foot wearing only a rough woollen sock, left by the assassin in the blood near the wall, confirmed this theory.

It now remained to discover the motive, and this turned out to be robbery. Drawers and wardrobe had been ransacked and a piece of jewellery was found on the floor. Thus the investigators had already a definite trail to follow. The antecedents of the servant, her friends and acquaintances, her description and that of the man with the moustache, and, furthermore, a description of the stolen jewellery, which was obtained from friends and relatives, brought the two fugitives into the net the police at once spread.

This case is a type of crime the police constantly have to deal with and one of the most difficult because almost featureless. The man was an amateur and therefore unknown to the police. The double attempt to lead the investigators astray, first the simulated forcing of the door and then the foolish but spectacular grouping of the glasses, proved him to be of mediocre intelligence and limited education. The flight of the servant denoted that she was the dominating personality, otherwise the man would have insisted that she remain and would perhaps have bound and gagged or chloroformed her. This analysis shows that the modern investigator must be a practised psychologist as well as a clever scientist.

Apart from all the minutiæ of an expert investigation, it is very necessary to determine immediately the type of criminal for whom the police have to seek. Experience, experiments, and a systematic classification of crimes, noting constantly the points in common, have gradually eliminated much that was formerly mere guesswork, so-called deduction, and often a blind groping in every direction except the right one. Now in most cases the expert can state unhesitatingly whether the crime is the work of one or several men, of a professional or an amateur, and even gauge the social standing and former occupation of the criminal. Every step taken by the assassin before and after the crime is an indication of his mentality, as though he had left behind a palpable emanation, produced by the nervous tension under which he laboured. His finger-prints are clear if he perspired freely, less so if his skin was dry. The scratches where his tools slipped indicate fear and haste. The tidiness or disorder of the room where the tragedy was enacted; the care with which possible traces were effaced; the irresistible craving for stimulants — spirits or wine; forgotten objects, wisps of cloth, buttons, hairs, even parasites, all portray the personality of the nocturnal visitor. These details apply to crimes committed for immediate gain and in houses.

It is otherwise when a body is found in a field, wood, or any open ground. Here the most important point is, How did the assassin and the victim reach the spot? If they walked, someone inevitably saw one or the other. It is almost impossible, so populous is the world, for several people to walk to some deserted spot without being seen. If the murderer encountered the victim in the open, it would rarely be in a spot far from habitations. Then, unless the crime be committed with a firearm, from a distance — and apart from the detonation I have already described how easily a criminal may be traced by cartridge-cases and bullets — there is usually a struggle, cries, objects dropped, footsteps, and a legion of other indications.

The second question which naturally follows is, How did the criminal get away? If by car, its passing will have been noted. If by tramcar, railway, or omnibus, some observant employee will inform the police of the fact. There may be mud, blood-stains, or scratches on his person. So again capture becomes practically certain.

There remains the premeditated type of murder, cunningly planned and often cleverly executed. Such murders, apart from the inevitable traces, always lead to the detection of the criminal by two broad paths: the premeditation and the motive. I can best illustrate this by relating a case which happened not long ago whilst I was studying the methods of the Lyons police.[1] A man came to headquarters with a letter and a will, which he alleged his wife had sent. Husband and wife had been separated for over a year. The letter, which was undoubtedly in the woman's handwriting, informed the husband that she intended to commit suicide because he no longer loved her. The will made him heir to a large sum which the wife had but lately inherited from an uncle in Canada. The husband demanded that a Sûreté officer should be present when the wife's flat was entered, since he feared she had indeed taken her life. He related that upon receiving the letter he had at once hurried to the house where his wife lived, but had obtained no reply to his loud and repeated knocking.

Right at the outset we noted several curious points. The letter and will were supposed to have arrived that morning whilst he was still in bed; yet he was most carefully and neatly dressed, even to a handsome pin in his tie. The concierge and the post-office declared that no letter addressed to the man had arrived by the first post; and he averred that he had destroyed the envelope. When we reached the woman's flat, we found that there was a large electric bell, whereas he had spoken of knocking. The woman was indeed dead. She was lying peacefully in her bed and the doctor diagnosed an overdose of some narcotic. On the bedside table stood a bottle labelled 'syrup of chloral.' Traces of liquid in the bottle and on the cork, examined under the microscope, showed that the contents had not been chloral, but a much more powerful drug.

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[1] See 'The Iron Nemesis,' in *The Invisible Web.*

The room was searched and on the carpet one of the detectives discovered a silver wire no thicker than a hair, some tiny fragments of blown glass, and a slip of metal such as doctors use to cut the glass bulbs which contain drugs for hypodermic injection. The wire was undoubtedly from a hollow needle and the tiny bits of glass from a bulb which had contained a poisonous drug. But no syringe was found. Clearly, if the woman had used a hypodermic syringe, it would have been in the flat. Thus at once not suicide but murder became a probable solution.

A further investigation disclosed the fact that the letter had been written with the black ink from a bottle on the writing-table, which was now empty except for a few drops; whereas the will had been written with thin blue ink of the kind used for fountain pens. Yet there was no fountain pen in the house, nor had the dead woman been in the habit of using one, for all the housekeeping entries and several letters to friends, which the investigators succeeded in tracing, were written with the same black ink found in the bottle. It thus became apparent that the letter and will, which made it a clear case of suicide, had been written in the presence of an unknown, who when the ink gave out proffered his fountain pen. Therefore it was probable that both letter and will had been suggested or obtained by threats. Furthermore, part of the will had been blotted on a pad, which when photographed, revealed traces of a rough draft in a man's hand.

It was finally ascertained that it was the husband who had conceived the truly fiendish plot. He had sent his servant, a Belgian named Devos, to his wife, who had made several appeals for a reconciliation, with the suggestion that she should write the letter and will, which he promised to post, and that afterwards she should take some chloral in order to simulate suicide. He was a plausible rascal and had apparently convinced her that thus she would terrify the husband and bring about the desired reconciliation. The wife had followed the servant's advice, written at his dictation, and taken the contents of the bottle which the man had supplied. Then when she was under the influence of the narcotic, the plotter had entered through a window and injected a drug which killed her.

By openly calling at the Sûreté with the letter and will, the criminal had hoped to convince the police that it truly was suicide and thus prevent an investigation. It was just a wee bit overdone; the careful dress, the absence of envelopes, and the remark about knocking, when there was an exceptionally shrill bell, had instead aroused our suspicions.

Among the many cases the murder of Charles Tellier demonstrated more clearly than any other the wonderful chain of proofs the scientists are now able to forge from clues which no police-officer could ever perceive. It is indeed one of the many triumphs of the French police.

CHAPTER V

THE CLUE OF THE BLIND BEETLES

As I hurried down the dingy stairs from the Bertillon laboratories, it seemed to me that a voice called my name; but I had worked through the night and was eager for breakfast and a rest, so for once I feigned not to hear. The vast palace of justice through which I was compelled to pass was already crowded with barristers walking in groups and smoking cigarettes, or conferring in undertones with their clients. A dull roar of voices echoed and rumbled through the 'hall of lost footsteps'; meaningless, savage, sinister, and pregnant with all the woes of mankind battling with the law; that Moloch whose fiery breath scorched innocent and guilty alike. I halted a moment as the doors slammed shut behind me, inhaling the morning air, and gazed with relief at the spacious street thronged with men and women hastening to their daily toil. But I was not to escape so soon. When I reached the main gate, I saw with dismay that a Sûreté car had stopped at the kerb and a hand was beckoning me to approach. In the car were M. Dufresne, Colbert, and Inspector Rousseau, who was nicknamed the Brigadier.

'Come along,' the old fellow cried cheerily, evidently enjoying my annoyance; 'you are just in time. A drive to the river will do you good.'

'But I've worked all night,' I retorted, 'and I want some coffee.'

Rousseau looked at me with feigned surprise.

'When I joined the criminal section,' he remarked, 'I was informed that my hours were midnight to midnight. Was it not so with you?'

M. Dufresne laughed at this home thrust. 'We are all in the same boat,' he said. 'But we'll stop at a café on the way, for breakfast. Bertillon cannot arrive before ten — and we can do little without him. Jump in!'

'What is it, then?' I asked, as we glided swiftly towards the Champs Élysées.

'I know very little,' Rousseau growled. 'A *sergent de ville* arrived an hour ago and related that the body of a man had been found in the Bois, near the Saint-Cloud gate. You had just gone when I telephoned, so I sent for your outfit; the driver has it.'

After a hurried cup of coffee and rolls at the Porte Maillot, where a policeman was waiting to guide us, we made good speed through the wide avenues of the deserted Bois de Boulogne. Near the race-course our driver turned to the left and stopped the car on the edge of a narrow path, where two gendarmes stood on guard. A few minutes later, M. Bertillon came hurrying towards us, accompanied by one of my colleagues. A bulky package, tied with stout ropes, was lying under some bushes. It contained the body of a man, doubled up and wrapped in tarred paper. It was obvious at once that the poor fellow had been murdered. Hair and face were streaked with blood and a gaping wound indicated that he had been felled from behind by a blow from a club or a hammer. The man was dressed only in shirt and trousers, but a vest, jacket, collar, and tie were in the parcel under the body.

Bertillon gazed in silence at the gruesome discovery, then he scrutinized the ground, the bushes, and the path, making a mental photograph of the scene.

'Whoever deposited that package at this spot must be a giant in strength,' he exclaimed, turning to me. 'At a rough guess, judging by his size, and adding the ropes and paper, that poor devil must weigh over a hundred and seventy pounds, and we all know what it means to handle a limp, inert body. For although he may have carried it on his back at first, he certainly lifted it in his arms and placed it carefully on the ground. Moreover, he must have come some distance with his burden; the ground is soft from the recent rains, but there is no trace of wheels. The murderer evidently realized the risk he would run if he used a vehicle.'

'Yet he could not have walked with that huge bundle from Paris,' I objected, 'or many people would have seen him.'

Bertillon pointed to the river. 'That was his highway, I'll wager. Stay here; I'll see if there are any marks on the bank. Don't approach that spot.'

Step by step my chief walked towards the Seine, which flowed past not far away. Half an hour elapsed while we waited in silence. I saw by his expression when he returned that what he had seen was of little value to us.

'A clever scoundrel!' Bertillon cried. 'He used a motor-boat, I imagine; the keel has bitten deeply into the shore; and he tied a thick cloth or a blanket over his boots — the impressions are huge and quite shapeless. That explains why there are no footprints here. This murder was committed at least a week ago, and the body has lain hidden on the assassin's premises. It was brought here some time after midnight.'

'How do you know that?' M. Dufresne asked, astonished.

'Because it rained heavily all the week, and rain fell yesterday until about midnight, yet you see that the paper and the clothes are quite dry. Moreover, rain would have effaced even those inchoate footprints I saw on the bank. Now — get some test-tubes ready; only the inevitable traces on the body can help us.'

I handed my chief a box containing a number of tubes with blank labels, on which I inscribed whence the contents had been taken as he returned them to me. Bertillon's first care was to examine the matted hair, thick with congealed blood, and from it he removed some grit, particles of yellow sawdust, and fragments of what I gathered were sand and coal. Last of all he detached several hairs and a tiny piece of cardboard.

'Give me the portable microscope,' he said, 'and move the rays of your projector slowly over the whole surface of the cotton shirt.'

Whilst Rousseau connected a cable with the battery in the car, I adjusted the tripod. It was a new device Bertillon had conceived — a short arc, enormously magnified by complex lenses and reflectors, produced a concentrated beam of dazzling brilliancy, which could be focussed to any angle! This ray my chief followed with a microscope attached to his head by a mask which excluded all extraneous light, and also left his hands free. Suddenly, as the beam fell on the left shoulder, Bertillon held up his hand.

'Give me a collodium slide; there are some parasites or insects here — they are too small for the tweezers.'

Carefully he pressed the sticky glass slide on a round stain and then handed it to me to pack. Finally he straightened up with a sigh.

'That is all, I'm afraid. I have rarely seen a case where there were so few indications. Remove the body to the mortuary,' he added, turning to Rousseau, 'and ask Doctor Maupert to let me have a report at once. Circulate the dead man's photograph and his measurements among our inspectors and send the clothes in special waxed paper to the laboratory. You, Monsieur Dufresne, will, I suppose, begin your inquiries up and down the river. This is going to be a difficult investigation. Remember — the murderer is extraordinarily cunning and athletic. He used a boat and must have landed after midnight. I can say nothing more for the moment. Heaven knows whether we shall even be able to identify the victim. Keep all news of this discovery out of the papers until we know more.'

The minute work at headquarters was extremely trying. Our first care was to analyse the tiny traces we had gathered, and these were queer to say the least. In the hair, which, although still dark at the roots, was grey at the points, were fragments of coal, sand, and sawdust. The microscope proved the coal to be anthracite; the sand, silicate, ferruginous silicate, and quartz; and the sawdust, when split with a microtome, turned out to be composed of pine and oak. The stains on the shirt were also coal, intermingled with traces of mildew. When I carried my report to my chief, I found him at work on the collodium slide. He looked up as I entered and gave a sigh of satisfaction.

'When you come to classify this case,' he said, 'label it "The clue of the Anophthalmi." I know you revel in the dramatic.'

'Anophthalmi,' I said in surprise. 'That means "something without eyes," doesn't it?'

'Yes; the two tiny insects we found on the shirt are a species of blind beetle. Moreover, they are quite colourless — absolutely devoid of pigment. They've bred for generations in the dark. Taken together with the coal and sand, I should say that it proves the body was hidden for a time in a cellar or a vault. It only remains to find it.'

'A simple matter,' I remarked sarcastically. 'We have merely to search every house in Paris and the suburbs, until we discover such a cellar.'

My chief frowned. 'I see you forget the formulæ that apply to every premeditated murder: *Who profits by the crime?* and, *Seek the woman*. One or the other will lead us to that cellar. Go now and see what else the clothes will reveal. Search for tailor's tabs and manufacturer's names. We can do nothing until the dead man has been identified.'

'The papers have been authorized to publish his description?' I hazarded.

'No, I have requested them not to do so. On the contrary, the "Journal" has merely stated, at my suggestion, that the body of a man, probably a foreigner, has been found. We must go very warily to work, or the criminal will slip away.'

The rest of the day was spent searching for further clues. A piece cut at random from each garment was placed in tubes of sterilized water and allowed to macerate, and the resulting liquid was strained in a centrifugal machine. The deposits from each tube were then spread on sterilized slides and examined under a powerful microscope. Thus we found that the coat and vest were covered with an abundance of *Saccharomyces cerevisiæ*, in other words, the bacilli of alcoholic fermentation. But no such bacilli were discovered on the shreds cut from shirt, trousers, or boots.

Bertillon nodded thoughtfully when I placed enlarged photographs of the cultures before him.

'Yes,' he said, 'the body was dressed in shirt and trousers only. The coat and vest were therefore hidden in another spot, where wine or beer was probably stored. Thus we may safely affirm that the murderer disposed of several cellars. You see, already a definite path is opening up. The use of a boat makes it obvious that the house is near the river. There are also deposits of coal, sand, and alcoholic drink in the cellars, and firewood has probably been sawed there from logs of pine and oak. When we find those cellars, the blood-stains on the floor and walls will constitute a further proof, since the wound must have bled abundantly. Rousseau and Colbert are combing all riverside districts and will show a reconstructed picture of the murdered man to every concierge. Soon we shall know who he was and where he lived. Unfortunately for us, he evidently was not married, or his wife would already have reported his disappearance. I have men questioning all the owners of boats for hire; perhaps we shall pick up the trail there. Meanwhile, you may take the districts between Notre Dame and Neuilly yourself, and visit all cafés, such as a man of modest means would frequent. Say that you are searching for a relative, and describe the poor devil as he must have looked when alive. Take care not to let it appear that you fear something has happened to him. Make up as an accountant or a clerk. The victim's hands show no traces of manual labour and his right sleeve is cleaner and newer than the left.'

I stared at my chief in surprise. 'His right sleeve?' I asked.

'Yes — yes — surely you can reason from cause to effect. As a shopman he would have used both arms equally, whereas if his job was writing he would wear one of those half-sleeves of lustrine, to keep his cuff from fraying out. Had he been a traveller his boots would have shown much wear; the uppers are not new, yet they have not been resoled. I think you'll find that a clerk or accountant is missing. A typist wears lustrine sleeves on both arms and his fingers show traces of flattening at the tips.'

I was about to go when the telephone rang, and I caught a glint of annoyance in Bertillon's eyes as he listened.

'It seems I was wrong,' he confessed with a rueful laugh, 'Rousseau is at the Barrière du Roule. A fellow named Ronsin — who has already spent several years in jail — has vanished mysteriously. He was an associate of apaches and loose women. He and several cronies owned a motor-boat and specialized in smuggling goods from the river steamers to cafés near the shore. Rousseau has left two inspectors in charge of the boat, which they found at Suresnes. Well — I had hoped this was going to be an interesting case. As it is, I'll leave you to investigate. Report to me to-morrow.'

I found my colleague waiting in a café much frequented by farmers from the suburbs, who generally come to town at dawn with their produce. His eyes twinkled pleasantly when he saw me.

'Hein?' he cried. 'The old Brigadier has lost no time. We shall soon get on the track of the gang. Bertillon was right about the murderer. This Ronsin had a partner noted for his strength. He is the man we want.'

'The photograph was recognized, then?' I asked.

Rousseau shook his head. 'I did not show it. I gave a verbal description. Sit down and share this bottle. Then we — what the devil?'

The door of the café had been flung wide and several uniformed police now came staggering in, carrying something heavy on a stretcher.

Rousseau stood staring a moment, his mouth wide open — the bottle of wine in his hand spilling its liquid in a gurgling stream on the floor.

'We have the body,' the foremost gendarme gasped, setting the burden on the floor. 'It's Ronsin; a bargee hauled it from the river.'

With a strangled cry Rousseau sprang forward and tore the tarpaulin from the stretcher. A bloated face with wide-open eyes, that resembled in nothing the man we had found in the parcel, was disclosed. The innkeeper had started forward when the gendarmes entered, but he turned away at the horrible sight.

'That's Jules Ronsin, all right,' he said with a shiver. 'I knew him well. Probably fell overboard and was drowned. He was always drunk.'

Hastily giving orders for the removal of the body, Rousseau slipped his arm under mine and hurried me away.

'Say nothing to our colleagues of this,' he cried. 'Two bodies! What a fool I've been. I ought to have had more faith in our chief. He told me to look for an employee who had worked in a city office. Now what shall we do?'

'Report at headquarters,' I replied. 'Perhaps Colbert has been more fortunate.'

So it turned out. The man we had found in the Bois de Boulogne was a bookkeeper named Charles Tellier, a man of forty, and of apparently honest and regular habits. He had disappeared ten days before, but his landlady had thought nothing of it, for he had informed her that he was taking a holiday. An investigation of his past revealed the fact that, although outwardly quiet and unassuming, Tellier had been a ladies' man and known to have had many dangerous intrigues, which on several occasions had caused trouble. Furthermore, he had been known as a constant frequenter of clandestine bookmakers. A search of his room in the rue de l'Harpe brought to light numerous betting-slips, and some love-letters signed Marcelle. Now at last we progressed. Tellier had for some months taken all his meals in a species of students' tavern, facetiously named the 'Cloche de Bois' — an allusion to the custom of the impecunious youths of the Latin Quarter, who usually vanished when rent day came round. The landlord was Jacques Cabassou, red-faced, jovial, and generous, whose rumbling voice held a greeting for all; and who, notwithstanding the sign 'no credit,' never refused to serve a meal or a drink to the men and women who made his picturesque place their headquarters. Dressed in peg-top trousers and velveteen jacket, with the wide-brimmed hat and flowing tie of an art student, I soon became a familiar figure in the tavern. I was at once disagreeably impressed by the handsome, dashing woman who always sat behind the bar. She was Cabassou's wife, I learned, and her name was Marcelle. It was her duty to look after the till, and to make out the bills; and soon one of these found its way to my pocket. When I had enlarged and compared it with the letters found in Tellier's room, it was plain that the writing was the same. There had evidently been an intrigue between these two, although it might have been no more than a harmless flirtation, since the letters were merely sentimental. Tellier had worked for a wholesale firm near the Luxembourg Gardens and inquiries disclosed the fact that a colleague named Guillaume, who had been in Tellier's department and apparently friendly with him, had applied for permission to visit his parents the day before Tellier vanished. Rousseau at once set to work to discover where Guillaume had gone. For several days the old fellow vanished; then one morning, as I entered my chief's office with my daily report, Rousseau came in. He was dressed in a long motoring ulster, and his first words showed that he had important news. Bertillon motioned him to a chair and settled himself to listen.

'Guillaume is the man we want,' Rousseau began. 'He was also in love with the innkeeper's wife. Cabassou takes bets for the races, by the way, and both Tellier and Guillaume were in his debt. It was because of this that Guillaume took train to Rouen, to try to borrow some money from an uncle. But he failed. He then went to Antwerp, where he sold some diamonds. I've just come from there.'

'Diamonds?' Bertillon queried.

'Yes; and Tellier's landlady had often noticed that her tenant possessed several fine rings and a tie-pin of which he was very proud. The Belgian police have sent a man with the stones Guillaume sold. He is waiting outside.'

'But where could Guillaume have committed the crime and where could he have hidden the body? Are there any cellars at his disposal where he lives?'

Rousseau shook his head. 'No; but he probably enticed his victim to some safe place where he could kill him. He rents only a bedroom so far as I know.'

'And where is Guillaume now?'

'He returned to his work two days ago.'

Bertillon pressed a bell. 'Very well. I feel sure you are wrong — but I'll apply for a warrant. Go and arrest Guillaume and search his rooms, but say nothing. The *juge d'instruction* in charge of this case must question him.'

When Guillaume left his work that day, he found us waiting outside, and after the usual formalities he was taken to his lodging. A search revealed nothing and we were about to go when a vase with some flowers attracted my attention. It contained no water, and tied to the stem of the plants were two circlets of gold and a pin from which the stones had been taken. At sight of these our prisoner sank into a chair, pale as death.

'I swear,' he cried in a shaking voice, 'that I know nothing of those things. Some enemy brought them to my room.'

Late that evening the man was brought before the examining magistrate, and the queer tale he related, although I thought it a foolish defence, evidently impressed my chief.

'I had gambled away all my money,' he began, in a voice hoarse with emotion, 'and Cabassou, who keeps the inn where I take my meals, lent me several thousand francs. Lately he began to press me for the money. Then quite unexpectedly two weeks ago, he gave me a tip which he said was absolutely sure. I had collected a large sum for my firm and I backed the horse with this. Of course it lost. Tellier, who kept the firm's books, came to me and demanded to know what I had done with the money. He hated me because Cabassou's wife had been to a theatre with me once or twice, and he was jealous. He gave me three days to make good the amount. I obtained a week's leave and tried to borrow ten thousand francs from my uncle. But he refused to help me. In despair I went to Cabassou, who had always been so friendly. He said that what I asked was impossible. At last when I told him that I should shoot myself rather than go to prison, he said, "There is a Chinaman, a Dr. Ho Fang See, who lives in the rue de Rivoli. I once helped him when he was in great trouble, whilst a student. Go to him this afternoon with a letter I will write. Dr. Ho Fang See promised never to forget what I did for him. I think he will lend you the money. But in return I want you to bring me absolute proof that Tellier and my wife are lovers." As Cabassou said this, he changed from the smiling, jovial fellow I had always known, until his face was that of a fiend. I was frightened, but I had no love for Tellier and promised. So he gave me the letter.'

'This Chinaman, now, what is he like?' Bertillon asked.

'I will try to describe him. He is a beauty specialist. When I arrived at his surgery, I was ushered into a large room all hung with curtains and lit with coloured lamps. Several women were waiting, but when I explained to the servant that it was a private matter, the doctor received me at once. He is a tall, thin man, with a yellow and strangely expressionless face — typically Chinese. I could not see his eyes, for he wore tinted glasses. But I noticed his hands with their long nails — they were white and slim, and when his fingers touched mine by chance they felt cold as ice. He spoke with a foreign accent in a curiously sibilant voice. He did not rise when the coloured servant announced me, but waved me to a chair.'

'How, then, did you see he was tall?' the examining magistrate asked.

'I judged from his height as he sat at his desk. I gave him the letter from Cabassou, which he read and then burnt at once in a brazier which stood smoking beside his chair. He informed me that the sum I needed was more than he could afford, but if I cared to go to Antwerp and sell some diamonds which a client had left in payment, I should be able to raise considerably more. Of course I agreed and left the same night.'

'Are these the stones he gave you?' Bertillon asked, holding out the diamonds the Belgian detective had brought.

Guillaume examined them carefully; then he nodded.

'Yes, I think so. I don't know much about jewels.'

'This Cabassou; you have known him some time? What kind of man is he?'

'Oh, a fine fellow. Generous — very good-natured, with a cheery smile for everybody. He helps all who are in trouble, just as he helped me.'

'Yet you say his face became distorted with rage when he spoke of Tellier?'

'Yes; I was very surprised, but no doubt jealousy makes a man angry.'

'Tell me, does he live over the tavern? Is the house his own?'

'Oh, yes — his apartment and office are on the second floor, the place is very big, and his wine-cellars are famous.'

At a sign from my chief, Guillaume was led away. When he had gone Bertillon looked at the magistrate with a queer smile. 'Please let me have a warrant for the arrest of Cabassou. I think a search of those cellars will complete this case. You, Colbert, watch this Chinese doctor's house. Don't let him slip away, whatever you do. I do not think this jovial innkeeper will be suspicious,' he added, turning to me, 'but be careful. Take all the men you need and go armed; one never knows. A creature capable of weaving such a plot is dangerous, and I distrust a man who *always* smiles. Remember, if I am right, he is immensely strong; he carried the dead man in his arms. Let me know immediately what evidence you find.'

Whilst Rousseau and several detectives took up positions from which they could watch the tavern, I entered dressed in my art student's clothes and ordered a meal and a bottle of wine. The place was filled as usual with a motley crowd of men and women, and from the large room at the rear came the sounds of music and song. It would have been dangerous to try to arrest the fellow whilst so many people were there, for in the ensuing confusion he might easily escape. It was hard to believe that the loud-voiced, laughing landlord, ready with a joke and a pleasant word for all, could be a cold-blooded assassin, yet we of the Sûreté had seen strange things, and as I watched his wife, whose burning glances seemed to hold a promise of wild passion in their depths, I began to think that my chief had as usual sensed the truth. Towards midnight Rousseau came and joined me, and feigning to be tipsy called for a bottle of special wine.

'I have heard you have some good stuff in your cellars,' he cried, 'but you keep it for your own use. Why not let me choose for myself? I'll pay the price.'

Cabassou laughed boisterously. 'Come, then, my friend, take your pick. It shall never be said I cheat my customers.' He took a massive key from a hook and, lighting a candle, beckoned us to follow.

That was what we wanted. The cellar to which he led us was vast and had a large barred window level with the street. Around the walls in their hundreds were dusty bottles carefully stacked in their bins. There appeared to be no other issue from the place but the door through which we had come. Nevertheless, we had our orders, and without a moment's hesitation, Rousseau stepped forward and pulling a pistol from his pocket curtly commanded Cabassou to stand against the wall with raised hands. At sight of the weapon the man's face became convulsed with rage.

'What are you — footpads?' he growled.

'No, from the Sûreté. Here is our warrant for your arrest. But first we wish to search this place.'

'Arrest? You are mad. What for?'

'That is for the *juge d'instruction* to tell you. Where are your other cellars?'

'I have only this one.'

Rousseau looked sideways at me, and said: 'I'll keep him here whilst you search. Better look behind the wine-bins.'

I at once set to work with lamp and lens, whilst my colleague twisted a chain around the fellow's wrist, and pulled him to a seat on a box.

My first care was for the stairs, and low down, near the ground, on the whitewashed wall, I found a large blotch which had been washed and scraped. It was blood, and in one of the denser spots I noticed some hairs. At my involuntary shout, Rousseau started up, and in doing so the chain slipped. Instantly our prisoner blew out the candle. I heard a loud thud and a scream; a fierce kick sent me staggering back, and at the same instant a head struck my chest with the force of a battering-ram, the door slammed, and, before we realized what had happened, we were shut in the cellar. My pocket-lamp had fallen, and was broken, but fortunately Rousseau had another. Pulling a couple of boxes beneath the window, I smashed the glass, and blew my whistle. At once two of our men came running down the stairs, and threw their weight against the door; but it was of stout oak, and axes had to be fetched before it could be opened.

By the time we reached the tavern, it was empty; only the woman was there, held by a gendarme. Cabassou had disappeared, and an open skylight leading to the flat roof revealed the manner of his escape. Whilst Rousseau sent cyclists to telephone and telegraph, I continued my investigation. Bertillon was immediately informed of our fiasco, and joined us soon after. The blood-stain on the wall was cut out bodily and packed, and, finally, behind some crates, we found another door which led to a second cellar. In this there was a large box which contained some fragments of coal. The floor of this cellar was covered with sand, and on two sawbucks in the centre lay a heavy log, from which a heap of firewood, piled in a corner, had been recently sawed. Sawdust had collected around the log, and some of it was mixed with sand. Yet, beyond the one blood-stain, we found nothing to confirm our belief that a crime had been committed there.

When I mentioned this, Bertillon pointed to a tiny window. 'This is not the place where those blind insects breed. I am convinced there is yet another cellar — with no window. That is where Tellier was killed, but his coat and vest were hidden here. See, there is the sand, the sawdust, the coal; and in a place filled with barrels and bottles of wine, you will have an abundance of the bacilli of alcohol fermentation. The clothes were probably concealed in that box. You'll find that the wood is impregnated with liquor. We will test that to-morrow. First we will pass all this sand through a sieve; perhaps, we shall find some actual proof that Tellier came here.'

It was arduous work, but the result justified the seemingly useless task. At the end of several hours the sieve revealed some tiny fragments of cardboard and several scraps of thin paper. When these were assembled and gummed on a stout sheet, we saw that the shreds of cardboard were pieces of a railway return ticket, and the return half had not been perforated. The date was the day Tellier was seen alive for the last time; the station was that near his house; and the hour stamped on the ticket corresponded to the time at which he usually left for his office. The scraps of paper bore the words Charles Tellier and the name of a horse, with the words 'Five hundred francs to win.'

Thereupon a minute search for the third cellar began, and at last, when already it seemed as though a mistake had been made, we found a tiny, pitch-dark recess, gained by a door under the stairs. Bertillon's theory was vindicated: at last we stood in the place where the murder had been committed. Blood had splashed on the floor and walls, and the roof was alive with the Anophthalmi.

'A far cry from the Bois de Boulogne to this hole,' Bertillon said. 'But the blind beetles have led us here. It only remains to capture that devil Cabassou. Guillaume shall be released at once. Perhaps Colbert has something to report. Set men to watch this place, though I fear the fellow will not be foolish enough to return. Yet his mad passion for that fickle woman may prove his undoing.'

The next morning I was summoned to Bertillon's office. With him were Rousseau and Colbert.

'We have been inquiring into the life of the mysterious Dr. Ho Fang See,' Bertillon said. 'His consulting hours are two to five, and his concierge says he has come and left punctually to the minute for the last two years. He is an excellent tenant, it appears; quiet, courteous, never any trouble. His patients are exclusively women. His flat is not far away, in the rue du Louvre. He keeps only one servant. Colbert thinks he is an Indian or a Burmese. Nothing strange in all that. But in the same house where this Chinaman lives, *our friend Cabassou* *also has a flat, and on the same floor.* Those two are confederates in some nefarious business. Probably they are drug traffickers. Every day, just before the doctor left for his surgery, Cabassou arrived at his flat, nor did he leave until the Chinaman returned. He never slept there, but sometimes a woman would visit him. A woman with red hair, so it is not his wife, for she is dark. The concierge in the rue du Louvre says that last night, to her surprise, the doctor, who rarely went out at night, came hurriedly in just after midnight. She was in bed, and did not see him, but he gave his name as usual in that queer sibilant voice of his, as he passed her window. Colbert has searched the innkeeper's flat. A huge fire had been lit, and the charred remains of papers and clothes were still to be seen. Nothing else; just paper and clothes, but every sign of a hurried departure. On a table was a railway time-table, open at the train to Berlin. That, of course, is probably just a blind; but we've wired the frontier in case it isn't. I want to know what the connection is between those two men. Colbert shall call at the surgery to-morrow, and take an imprint of the lock. Then, when the doctor has gone for the day, you and Rousseau must enter and have a look at the place. It's not legal, and a risky business, besides, but there is no other way. You will, of course, touch nothing; but — I fancy the Oriental is hiding Cabassou. If you find nothing, we will search his apartment.'

'But why the surgery first?' I asked.

'Because by now he has heard of our visit to his confederate's rooms, and he probably fears that we shall call on him, too. The surgery is less likely; moreover, the Frenchman could easily slip in among the patients, dressed as a woman. I'll have a dozen men within call. This time don't let him fool you.'

The next afternoon, so soon as we had seen the long, slim figure of Ho Fang See come out of the house in the rue de Rivoli and jump into a taxi, one of our men, dressed as a postman, kept the concierge busy, whilst Rousseau and I slipped upstairs. The key Colbert had obtained for us fitted smoothly, and a minute later we were inside. A thick, silken carpet deadened our footsteps. Strange Japanese armour and huge vases gave the hall an Eastern appearance, and the air was heavy with the queer odour of sandal and joss-sticks. Our hearts beat fast at the thought that perhaps a desperate murderer was hidden in one of the rooms. Silently, and with infinite caution, we opened door after door. Not a sound came to our ears. A huge, heavily carved wardrobe, in a spacious salon, was filled with Chinese clothes, and the many cupboards contained drugs and surgical appliances. When we had visited every hole and corner, Rousseau gave a sigh of relief.

'The Chief was right — this yellow scoundrel deals in dope; but our friend Cabassou is not here.'

At that instant a key grated in the lock, and we had barely time to slip behind a curtain before the door opened and someone came stumbling into the room, breathing as though he had run a race.

There followed the snap of a switch, and several tinted lamps threw their beams on the yellow face of Dr. Ho Fang See. A moment he looked around with suspicion, then he removed the tinted glasses which had concealed his eyes, and sank into a chair. I could not conceive what had brought him back, but I was soon to know, for the fellow rose abruptly and looked at the clock on the mantel.

'Half-past seven,' I heard him mutter. 'If only she will come. I *must* see her! I *must!*'

My skin crept at the words, for they were not uttered in the sibilant voice of which Bertillon had spoken. Instead, the intonation was deep and guttural. What happened then was like a horrid dream. With a quick gesture the man pulled at his hands as though removing gloves, and the white skin and long nails came away together, and were flung on the table. A wig of shining, black hair followed. Then he stepped to a washstand against the wall, and laved his face with a sponge. I shivered with dread as he turned to us once more. Gone was the yellow tint; the dead, expressionless face of the Chinaman had filled out, the features had subtly altered, the skin was flushed and healthy, and before us stood the man we sought — Cabassou! Thinner, indeed, than when we saw him last, and lacking the jovial, cheery smile, but without a doubt the same man. We were about to spring out from our hiding-place when a bell rang, and the fellow stepped quickly into the hall.

There came a shrill cry in a woman's voice, instantly hushed, and the murmur of conversation. It was our opportunity. Rushing across the room we gained the door just as he entered, followed by his wife. What a struggle that was! The man was a giant, with sinews of steel; and had we not taken him utterly by surprise, we should have been overpowered. As it was, he swung us off our feet more than once, as he vainly tried to reach his desk. Despite our weight, he succeeded in partially pulling open a drawer, and we saw it contained a heavy pistol. But at last Rousseau managed to twist a scarf round his neck, whilst I pulled at his feet with all my strength, until at last we came to the ground in a heap. Yet even then it was many minutes before we were able to snap handcuffs on his wrists and to tie his legs together. During this terrific fight the woman had stood as though turned to stone; but when she saw that her husband was taken, she snatched up a slender knife from the table and came at us with blazing eyes. Rousseau wrenched the weapon from her hand and held her, whilst I summoned our colleagues, and an hour later both were safely in the cells.

'A queer case,' said my chief, examining the artificial hands which had been part of the Frenchman's cunning disguise. 'It is the most extraordinary instance of a double personality that I have ever seen. His corpulency was produced by padding, of course. I don't know which was the cleverer; his make-up as Cabassou, or the rapid change to a yellow Chinee. The padding makes it obvious that the wife was his accomplice. They must have passed enormous quantities of poison to poor, helpless drug fiends. We shall learn more when she hears of the red-haired rival. Already five banking-accounts have been traced. The beauty of the scheme was that either of the two identities could instantly vanish in case of trouble. All would have been well had his wife not taken advantage of his daily absence to spend her time with other men. Cabassou, who is tigerishly jealous, must have found her out, and decided to get rid of both his rivals at one blow. He enticed Tellier to the wine-cellar, struck him from behind, dragged him to the hole under the stairs, and killed him. Then he evolved the plan which caused Guillaume to be arrested. He concealed the body in his cellar, and one night, with the help of that man who was drowned, he carried it to the Bois de Boulogne. Had it not been for those tiny, blind insects we should never have discovered the truth. No doubt Cabassou threw the apache Ronsin into the river afterwards in order to get rid of a dangerous witness. Well — as always — even the cleverest criminals are caught because of a woman. Had he not returned to his surgery, it is probable that we should perhaps have suspected the Chinaman, but we should not have discovered that he and Cabassou were one and the same.'

CHAPTER VI

THE VARIOUS TYPES OF CRIME

BURGLARIES AND THEFTS

It is not my intention in this chapter to go into the genesis of crime as formulated by Lombroso or Lacassagne, although this important section and its corollary, the prevention of crime, or rather the suppression of criminal tendencies in the young, is a problem well worth studying. But for the moment I merely desire to continue my review of the many methods of the professional malefactor and the manner in which the officers of the law combat and checkmate him. I hope that by relating in detail a few of the countless schemes which have been evolved by those who covet riches but eschew hard work, I may perhaps make their task more difficult.

Roughly, I suppose, crime can be divided into two broad general classes: the conspiracies and plots, frauds, confidence tricks, and blackmail; and the more brutal crimes of violence; under which heading come robberies, burglaries, thefts, and murder for gain. Murder unless premeditated is not always the act of a criminal, for it is often merely the result of a sudden snapping of mental balance and sanity.

Very rarely does any postulant to the lawless legion begin on a large scale. Petty thefts, known as 'pinching,' are generally the first step. He has his apprenticeship to serve. Later on personal aptitude leads him to select a speciality.

Every child left to its own devices instinctively becomes a primitive. The desire to find secret hiding-places, the lust for fighting, the impulse to belong to a band, are so many manifestations of a reversion to savagery, and with this reversion comes a relaxing of the moral and social restraints. Then expeditions to acquire property dishonestly, usually under the leadership of a more daring or more experienced chief, are undertaken. A spell in a reformatory, or later in life a term in prison, kills his last scruples and makes him a criminal for life. To the courageous, especially if he has learnt the rudiments of a mechanic's trade, burglary offers many illusory advantages. Or he may join a gang of pick-pockets. If the latter, he must start at the bottom of the ladder, for there are many grades and many intricacies in this profession.

Generally an efficient gang is composed of six or eight members. There are the beaters, whose duty it is to watch, follow, and indicate those who are worth robbing; the auxiliaries, who stumble against the victim, surround him and engage his attention whilst the 'hand' operates; and the 'carrier.' The 'hand' is a skilful artist. Years of practice have transformed the index and second fingers of his right hand into powerful dexterous pincers. The index has been developed until it is as long as the middle finger, and the grip of these pincers is astounding. It is never the whole hand which enters a pocket; only those two slender, supple, but immensely strong fingers. The instant the coveted object has been 'lifted,' it is 'passed' to the 'carrier,' who at once disappears. Thus an arrest and search of the 'hand' leads to nothing. Sometimes there are two carriers. The first passes the loot to the second, in case his sudden flight should appear suspicious. These gangs work in tube or hotel lifts, in packed omnibuses and trains, and, of course, wherever a crowd collects. Often they even provide their own 'stunt'; which may be a man who falls and apparently hurts himself badly, a street show, or a violent quarrel. Some pickpockets prefer to work alone, however. They cover themselves by an unfolded newspaper or a coat carried over the left arm and operate only during the rush hour. A sudden jerk of the lift or vehicle apparently causes them to lose their balance and lurch against a fellow traveller. Apologies follow and perhaps a hearty joke; but that moment has sufficed.

Not long ago a clever gang worked the tube lifts and used a pretty girl to hold the victim's attention. They had two methods. One of the gang carried a walking-stick, at the end of which was a tiny grip worked from the handle. With this he would pull at the ends of a man's shoelace, causing it to become unfastened. Then at an opportune moment the girl would point this out to him. Naturally the man could do no less than thank her and stoop to tie it. That was the signal for a stumble or a crush from the others and the 'hand' did its work. Or the girl would suddenly notice that her own shoelace is dangling. With a winsome smile she thereupon requests the unhappy man, whose purse or watch is to be lifted, to hold her paper and her bag. By this means the man's hands are both occupied, and — since the girl is very pretty — his attention also.

Criminal investigation departments are combating these malefactors very successfully by a methodical study of the numerous tricks and a careful classification of photographs and finger-prints. To these are added a detailed report of their haunts, their habits and favourite hunting grounds, and a very complete list of the receivers who buy the stolen watches and jewellery. Many of these 'fences' are spies in the pay of the police and assist them very materially in bringing the human parasites to book. But the ubiquitous detective — so long as he can dress inconspicuously and preserve his *incognito* — by mingling with the crowd, can best protect the community. His long experience and extensive knowledge of the methods of the light-fingered gentry help him greatly. But there are not enough men available to watch all the spots favourable to pocket-picking; and the citizen who must thread his way daily through crowded streets and travel in trains packed to their limit must learn to guard his valuables by carrying these in such fashion that they cannot be easily found. Hip pockets, waistcoat, and breast pockets are always at the mercy of the 'hand.'

Burglars have moved with the times and are to-day excellently equipped. Science whilst arming the police has also placed many efficient instruments at the disposal of the modern Bill Sikes.

Fortunately his work inevitably leaves traces behind, which, when submitted to the scientist, become glaring clues that lead to his capture. In fact, the more perfect his equipment the more easily is he identified. This may seem a paradox, but it is not so. A lock picked with a wire, or a catch pushed back with the blade of a pocket-knife, has no individual characteristics. It is generally the work of an amateur who breaks into a house because it is easily accessible. His booty is usually unimportant and easily converted into money. The gangs who employ oxyacetylene blowpipes, ratchet drills, sliding jemmies, and jointed levers acquire a personal touch in their use which the investigator learns to recognize as their signature. Furthermore, they go only after big hauls, and, since they are professionals, do not remain idle long. Nor is a modern safe-breaker's outfit easily transported. A car is needed.

All these are weak spots in their armour. If their expedition has been successful, the spoil cannot be 'passed' quickly; this compels them to have recourse to receivers or women; and finally a complex outfit necessitates the presence of several assistants. If numbers are strength in most cases, numbers inevitably spell capture to the criminal. Fig. I, on the opposite page, is a complete and up-to-date burglar's equipment, which was seized by the police. At the top are cylinders of oxygen and hydrogen and the formidable blowpipe. In front of the central cylinder is a pocket encyclopædia of criminal law, which the chief of the band had studied carefully in order to learn what risks he ran! Powerful crowbars, levers, and jemmies in profusion are seen beside the bag containing skeleton keys. This gang had taken the precaution of always carrying faked numbers ready to be placed on any car they 'borrowed' whilst on their expedition.

Fig. II is the photograph of a jeweller's safe of tempered steel which their instruments ripped open as though it were a tin of fruit.

Alas for their science! Two empty gas cylinders, which bore the name of the oxygen company that had supplied them, were forgotten on the scene of this exploit, and within a week the whole gang was caught. The revolvers found in their possession when the police raided their headquarters proved conclusively that they would not have stopped short at murder if interrupted whilst at work.

For a long time the police of several countries hunted another dangerous gang in vain. Then one day they broke into a house which had been newly painted.

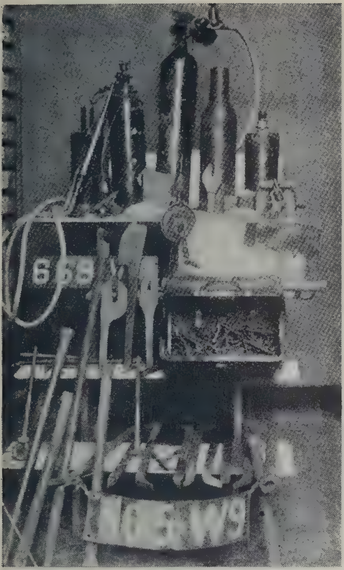


Fig. I. A complete and up-to-date burglar's equipment

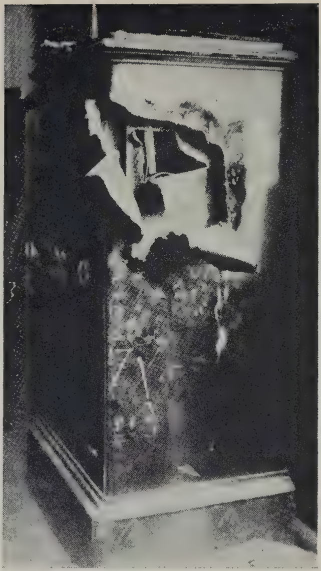


Fig. II. A steel safe ripped open as though it had been a tin of fruit

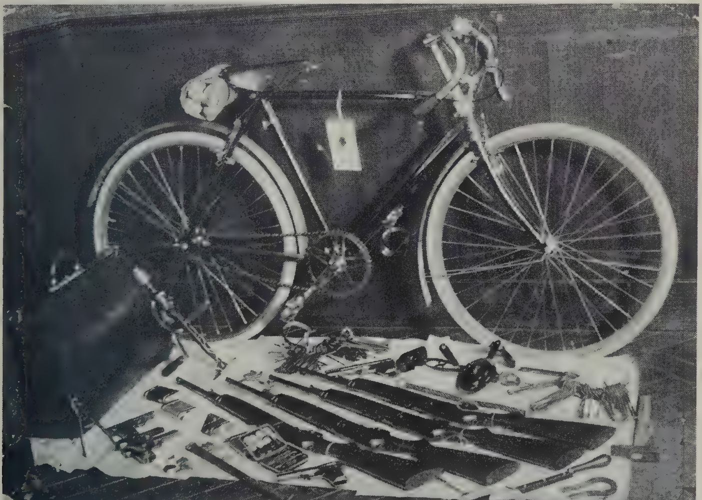


Fig. III. The bicycle belonging to the leader of the terrible Bonnot gang and part of their formidable armament

BURGLARS' OUTFITS AND A SPECIMEN OF THEIR WORK

Two days later detectives arrested a man suspected of a small theft. When his finger-prints were taken, some paint was found under his finger-nails. Nothing was said, but a microscopic particle of it was examined by the laboratory expert with the ultra-violet ray lamp. It was similar to the paint on the burglarized house. The man was released, but shadowed night and day. Within a month the whole gang was captured. Photographs of the marks left on the numerous safes they had broken into were compared with the tools found in their possession, and their guilt definitely established. Each man was questioned separately and the names of the receivers obtained. Thus most of the spoil was recovered.

Fig. III is the terrible armament which belonged to the Bonnot gang. They sold their lives dearly, as everyone remembers. The bicycle belonged to Raymond the scientist, their real leader, and the pocket behind the saddle contained dynamite bombs with detonators. Raymond was cleverly captured before he could make use of them. Detectives dressed as workmen opened a deep cutting to the water mains in front of his house. He was thus forced to lift the bicycle over the hole when he returned home. Instantly the detectives in the trench seized his legs, others caught the bicycle before it fell, and in a twinkling the fellow was helpless.

Coiners also have a very complex outfit. This type of crime is on the wane, however, for coiners are always tripped up when they try to pass their counterfeit money.

The methods of house-breakers vary little, even if their tools are very efficient. First of all, information is given to the 'operators' that a certain place is worth visiting. This information is obtained by specialists. They are the private inquiry agents of the modern burglar. With the information goes a plan of the building, details of where the money or jewellery is deposited, and the hours and habits of the inmates or employees. This may be elicited from servants or caretakers, or from loquacious neighbours.

Thereupon an ‘operator’ inspects the place, and decides on the tools which will be needed. A dark night is chosen; if foggy or stormy, all the better. The most important point is the method to be used for masking the work. One or several watchers, who will give the alarm in time, are also posted at convenient spots. In the case of shops or banks, the best precaution against robbery is, of course, to have the premises brilliantly illuminated and the blinds up, so that the constable going his rounds can see that all is well. There is, however, a case on record in New York where a screen was cleverly painted to represent the door of the strong-room. Hidden by this, the cracksmen were able to work in perfect security.

In Paris, not long ago, a safe which stood in the rear of a silk merchant’s shop, but was plainly visible from the street, was broken into early in the evening, whilst the noise of the passing traffic prevented the hiss of the blowpipe and the grinding of files from being noticed. The burglars had placed a beautiful embroidered screen before the safe, and thrown several bales of silk carelessly before it, to make it appear the work of employees. A tiny fragment from the screen was torn away by one of the criminals whilst working with a drill. By a process of elimination the detectives became suspicious of a firm of motor-repairers at Rouen. A search of the workshop brought to light a drill with a fragment of silk about an eighth of an inch square caught in the ratchet. The laboratory expert was able to establish conclusively, by means of colour photography and micrographs, that this particle came from the embroidered screen.

When describing the methods by which the police hunt down a criminal, I am unfortunately always confronted by the problem of how to do this without making the detective's task more difficult; how to avoid giving information, by which they may profit, to the legions of the underworld, and yet at the same time to place before the reader a summary of the manner in which science is now assisting the complex organizations which protect his life and property. There are, however, two important considerations which I fancy warrant the publication of some of the details. Every criminal, sooner or later, learns from his fellows of the methods evolved by the specialists in various branches of crime; but he does not perhaps realize sufficiently how formidable is the power which combats his activities. Prevention is better than belated punishment. And if I can drive home to the new generation that crime — apart from all moral considerations — is not worth while, it is sufficient justification for this lifting of the veil which criminal investigation departments have until now studiously avoided. If, furthermore, I may be so fortunate as to put the citizen on his guard, enabling him in a certain measure to forestall and parry a criminal undertaking, or to assist the police efficiently when a crime has been committed, then a commendable result will have been achieved.

I have, of course, only outlined some of the methods used by modern burglars for opening safes. These organized robberies are relatively rare. They are the prerogative of skilled men, who usually work in gangs equipped with costly and complex implements. It is not given to any burglar to vanquish the tungsten-steel doors and formidable locks of a modern safe. Experience, scientific knowledge, and individual aptitude are indispensable; furthermore, in some instances, before the organizers of such burglaries deem it safe to attempt the enterprise, weeks, or even months, may pass whilst members of the gang study the means of access to the steel monster, and the habits of the employees or inmates of the building where it stands. They must also prepare in advance a line of retreat, and decide upon the manner in which the loot shall be carried away and sold; and meanwhile they must possess the means to live quietly and unobtrusively.

It is natural, therefore, that burglars usually content themselves with entering flats, houses, or business premises at random, and stealing whatever is easily accessible. These minor robberies are a daily occurrence, and by their frequency have compelled the expert investigators to make a thorough study of the numerous types. It has been noted that most criminals deliberately select a speciality, and, if they are successful, continue to exploit it with little, if any, variation. Their choice is generally the result of knowledge gathered in some former profession. It is also due, in some instances, to an outstanding characteristic, such as exceptional strength, agility, a sensitive touch when dealing with locks, or unusual skill in making housebreakers' tools. Men who began life in the building trade, and are therefore accustomed to working on roofs and climbing across open spaces at considerable distance from the ground, when they take to crime naturally prefer to enter a house from the roof, through a skylight, or by forcing or breaking a garret window. The former mechanic and locksmith will attack that part of the citizens' defences which he understands thoroughly. He will use wire hooks and duplicate or skeleton keys, which past experience has taught him how to handle, whereas the carpenter will drill and cut through door panels. The mere labourer prefers levers or crowbars to force a door or to perforate a wall, a method which demands strength but little, if any, skill. These men rarely carry a weapon, in Europe at least, for, although they are willing to risk imprisonment if captured, they are not of the type that will kill if surprised. The burglar who carries a pistol, and is resolved to use it to evade capture, is nearly always a congenital and habitual criminal, one who was born to the underworld, whose whole life has been spent in unceasing warfare against the community, and who will kill at the least provocation. Such a man is in a class by himself.

Thus a study of the fundamental methods of burglars, their division into separate categories, and a classification of the men who usually operate in a well-defined manner, according to type, considerably reduces the work of the detective, because the report of the expert indicates where he must search for the malefactor. The former artisan does not usually frequent criminal haunts. He prefers to continue his old mode of life. If possible he even obtains work periodically, so that he need not fear an investigation of his means of livelihood. He knows well that gossiping neighbours may cause suspicion to fall on him, and that he will be least likely to arouse comment if he dresses in the clothes of his erstwhile trade. His burglar's implements he carries in a working-man's tool-bag, carelessly slung over a shoulder, so that, if he is seen leaving a house by servants or passing pedestrians, his appearance will lead them to think that he has been busy on some repairs.

Such a man labours under great disadvantages, nevertheless, for he is not assisted by the very real coöperation of fellow criminals. Sooner or later he perceives this, and becomes a member of a gang.

From the foregoing it will be seen that housebreakers may be superficially divided into five classes:

1. The occasional criminal, who is tempted by an open window, an empty villa, or an isolated garage. He works with rudimentary tools — a piece of iron, a hammer, a carpenter's chisel, anything that will serve to force an entry and can be left behind with little danger of being identified. This type usually steals his implements from a builder's yard or a workshop, or he will loiter at a spot where street repairs are going on or a house is in course of construction, and seize a moment when the workmen are away at meals. Such tools are, of course, useless as clues, but the marks they leave are generally a valuable indication to the police, since success will cause him to commit similar thefts.

2. Then there is the cat burglar, who relies on his uncanny agility, and enters a house from above. He rarely uses more than a glass-cutter, flypaper or a lump of putty to prevent the fragments of a window from falling noisily, and a knife or a small chisel for opening desks or cupboards.

3. Higher up in the hierarchy of housebreakers is the man skilled to open doors with wedge and lever or by picking the locks. He can generally be traced, because he was, or still is, a trained artisan.

4. There is also the Bill Sikes type, the true criminal, who combines cunning with ferocity, and carries arms; and, finally:

5. The aristocrat of the fraternity, the safe-breaker, member of an organized band, equipped with the micro-

phone, steel drills, jointed levers, blowpipe, or electric arc, which I have mentioned.

The first care of the trained expert when called to investigate a burglary is, of course, to search for the usual indications — footprints, finger-prints, forgotten objects, shreds of cloth, and all the minutiæ which are inevitably discovered. Should these be insufficient, he then examines the premises and the manner in which the criminal entered. He will thus be able to gauge at once the man's mentality, experience, and skill, and he can also determine whether the robbery was premeditated or committed at random. The experienced and clever housebreaker will naturally force an entry at the weakest spot. If the man laboured to break open a door when a tree growing before the house made access through a window a simple matter, it may be taken for granted at first sight that the thief was of low intelligence, but powerful in body; that he did not trouble, or had no time, to examine the house, or that he was not certain whether the window within easy reach from the tree gave access to a passage or to a room which might be occupied. This simple inference is subject to great modifications, however. If the room with the open window was actually occupied, it may be an indication that the burglar had ascertained this, and therefore chose the more difficult but safer way. Every circumstance must be carefully weighed to avoid an erroneous conclusion.

The next point is: How did the burglar force the door? The lock and bolts are therefore examined, the marks made by his tools photographed, and imprints taken of these in modelling wax, from which plaster casts or micro-photographs are made at headquarters. If the door was wrenched open by an experienced man, the marks of the lever which he used will begin near the top of the door, as far away from the lock as possible; the reason is that the wood can be more easily prized away from the lintel where it is not held by bolt or lock. The marks of wedges driven into the opening whilst the lever worked its way down, followed, perhaps by several smaller wedges, show that the fellow was accustomed to such work. If the marks reveal the use of several levers, it may be assumed that the burglar was assisted by one or more accomplices. A further scrutiny of the crushed wood with the aid of lenses will disclose whether the lever was curved, straight, claw-shaped, smooth, or provided with a non-slipping surface. It may be that the door was held at the top by a bolt which prevented the insertion of a lever.

Again, the manner in which the burglar overcame this obstacle is a valuable indication. If he had been unable to examine the fastenings in advance, there will be a series of small holes drilled through the door until at last the drill touched the end of the bolt. A larger hole at that spot indicates where a looped wire was pushed through to turn and pull the cylinder down. In one instance a piece of cardboard was found on the ground which had been screwed in position against the lintel. A hole in the centre corresponded with a single perforation in the door exactly opposite the cam of the bolt. The inference was clear. The man had been enabled to cut this guiding card in advance, and knew that whilst at work on the door he dared use no light. It was ascertained that a carpenter had repaired a broken stair some days before the robbery, and upon investigation this man turned out to be the burglar. Often the plaster casts of tool-marks make the guilt of a suspected man a certainty, if implements found in his possession adapt themselves to the moulds.

When the method used to enter the premises has been ascertained, the progress of the criminal in the house is determined. Electric flash-lamps are not so frequently used by the solitary burglar as the fiction writer would have us believe. The criminal knows that at any moment he may be stopped and searched. Tools, flash-lamp, skeleton keys, or other implements would reveal the true nature of his activities; therefore, in real life he prefers matches and a stump of candle. There are, of course, exceptions to this rule. A candle carried in the hand will drip, and reveal the direction of the housebreaker's movements, and so will burnt matches. Furthermore, there are many kinds of matches, and the central police laboratories possess tables where every known type of match is shown, unused and burnt, with indications of its duration. This may seem foolish precision, but there are several instances where it has proved extremely useful. Not long ago, when investigating a burglary, the expert found a number of half-burnt vestas of a peculiarly thin type on the floor of a bedroom. The tables showed that they were of Italian origin. The police communicated with the Italian Sûreté, and learned that a dangerous Milanese burglar had been traced to the French frontier. Thanks to the telegraphed description, the man was caught within forty-eight hours. A box of Italian vestas was found in his possession, and in his rooms were the stolen goods.

A candle was also instrumental in bringing a thief to the dock. Some marks were found on a dressing-table, where a burglar had stuck his candle whilst breaking open a steel jewel-box. By a queer coincidence a man who had been arrested in a raid on an ill-famed tavern had a stump of candle in his pocket. There were, of course, various other indications that made the police suspicious of this man; but as a final test enormously enlarged photographs of the end of the stump and the hollow mound of candle-grease on the dressing-table were made, and they proved conclusively that it was the candle found in the fellow's pocket which had been used by the burglar.

The important point about the light utilized by a housebreaker is that it indicates whether he was compelled to search for valuables, or whether he knew the lay of the land and where these were hidden. The disorder of a room will also show this, but it is not certain. On several occasions the thieves realized that an apparent knowledge of the premises, and what valuables they contained, would lead the police astray. They, therefore, replaced every object they had moved and effaced all signs of their search. Fortunately, the police expert requested the owner to examine everything minutely, and the trick was discovered. It is readily seen from this that an important phase of the investigation of a burglary is the examination of every detail which may reveal whether the criminal was a stranger working alone or whether he was someone familiar with the position of locks and bolts, and had ascertained if he could make a noise or use a light, and, therefore, whether the crime had been planned in advance. An instance where this gave the police the only clue they found, and led to the arrest of a dangerous thief happened some months ago.

The safe of a small provincial bank branch was forced during the night, and a large sum in notes, besides some jewellery which had been given to the bank for safety, was stolen. Apparently the only way into the stone cellar where the safe stood was from the bank itself, and the heavy iron gates had not been tampered with. The manager and cashier were naturally arrested, but not the slightest proof of their guilt was discovered. Furthermore, when the police experts examined the rear of the premises, they discovered traces of subsidence in a garden which terminated against the wall of the bank, and this depression ran in a straight line to a tumbledown shed. Under some boxes in the shed the police discovered the opening of a tunnel which ended under one of the flagstones in the bank's cellar. The garden and outhouse were part of a ruined estate, and had been unoccupied for many years. The experts reasoned, however, that, although the tunnel appeared to be the work of outsiders, only an employee of the bank could have known when the safe, which generally contained no more than a small sum, would be worth breaking into, and that the elaborate gallery was merely a blind. The manager and cashier were released, but kept constantly under observation, and thus some weeks later the police were able to follow the cashier to the spot where the money and jewellery were hidden. With the help of duplicate keys the cashier had entered the bank at night, cut around the lock of the safe, and extracted the contents. He had foreseen the danger of arrest, and the tunnel was just a trick to make the robbery appear to have been the work of strangers.

POISONS AND THEIR DETECTION

Since the pathologists and police experts have so perfected their methods that to-day poisons which the criminal is able to obtain easily are infallibly traced, even long after the death of the victim, murders by poisoning are becoming less frequent. The administration of secret and deadly potions was a very elaborate science in ancient Egypt, Rome, and Greece, and poisoners and distillers of potent draughts were a constant menace to human life in the Middle Ages. They flourished, indeed, right up to the beginning of the nineteenth century; but the development of medical knowledge and toxicology and the certain detection of this cowardly type of crime are successfully combating the poisoners. Witch-doctors among all savage tribes still possess a knowledge of toxic substances about which we know very little, but, curiously enough, recent researches have shown that only two poisons really formed the stock-in-trade of such notorious assassins as the Medici, the Borgias, La Brinvilliers, and the galaxy of British poisoners. These were arsenic and opium! Although there are many forms of arsenic, that which is easily procured and which is utilized by the poisoner is the As_2O_3, or white arsenic. The Marquise de Brinvilliers, who committed murder wholesale, called it 'La poudre de succession' (the powder which brings inheritances). It was first prepared for her by Sainte-Croix, who afterwards committed suicide by inhaling hydrogen arsenate when the police came to arrest him. There is no doubt it was also well known to the Medici and others of their ilk. In their day it was considered to be a very subtle drug, which defied doctors and analysts, since at that time they possessed no instruments which would reveal its presence.

In order to acquire an even greater immunity in its manipulation, Sainte-Croix experimented on rabbits and plants with the idea that arsenic could be assimilated and absorbed by their tissues in constant small doses, so that afterwards their ingestion would be equally as fatal as pure arsenic, although its primitive appearance and composition would be so altered that it could not possibly be traced.

The word 'poison' is derived from the Latin *potio*, which gives us 'poison' and 'potion.' Both, therefore, convey the basic idea of absorption in the form of food or drink, but there are many other ways in which a toxic substance may enter the system. It can be directly introduced into the blood through the skin or a mucus. It may be injected hypodermically or made to penetrate through a cut or a perforation of our dermic covering, or it may reach the vital stream by inhalation. Thus we arrive at the questions: What constitutes a poison? Why are many substances toxic in one form and not in another? How does poison kill? Of course this last question cannot be answered fully unless one also explains life; but, without becoming involved in inconclusive theories, it may be asserted definitely that life cannot exist without a constant exchange of matter; that which enters the body and that which, having relinquished some of its nutritive properties, oxygen, carbon, nitrogen, phosphorus, and the like, returns to the circumambient world. These substances do not retain their elemental forms, but combine with others always present in the organism. Phosphorus becomes calcium phosphate and magnesium phosphate; chlorates are transformed into hydrochloric acid or gastric fluid; and so on. Thus it may be taken as a fundamental principle that what is to be found in the human body is not generally poisonous, whereas those chemicals which are not in the tissues or the blood in some form or other cannot invade our organs without causing more or less serious disorders, and these, then, may be defined as poisonous.

There are roughly three distinct forms of poison: mineral, vegetable, and animal. Among the last-named are the toxic substances generated in venomous reptiles and insects, and the toxins or virus secreted by bacteria, which cause most if not all the known diseases. Then there are the alkaloids obtained from plants; and finally the numerous combinations classified as mineral poisons, to which must be added the various toxic gases, such as sulphuretted hydrogen, chlorine, carbon dioxide, and hydrogen arsenate.

The action of a poison varies considerably with the manner in which it has been administered, since the full effect does not manifest itself until it has invaded the veins, arteries, and capillaries which distribute the vital fluid to the nerve-centres, reflexes, and muscles. If the extraneous substance enters the system through the stomach, it passes from the intestines to the liver, is then carried in the black venous blood to the lungs, where the absorption of oxygen (hematosis) transforms the venous into red arterial blood. This passes through the aorta and is finally distributed to the capillary system which vitalizes and nourishes every part of the human anatomy. It is then that the poison carried with it will accomplish its mission of destruction. Yet Nature has placed a number of sentries to guard these paths. They are the liver, kidneys, glands, and the leucocytes or white globules of the blood which, by the phenomenon known as phagocytosis, destroy or transform the toxic substance into a harmless one. Furthermore, the ingestion of most poisons provokes a violent reaction in the stomach and intestines which thus eject part of it.

It becomes evident from this very rough outline that a poison will kill much more rapidly when injected hypodermically, and its action will be almost instantaneous if the injection is intravenous or if the poison is a gas which immediately reaches the arteries through the lungs.

Another important factor which greatly influences the action of a drug is the food or liquid with which the criminal has mixed it. Black coffee will often cover the bitter taste of alkaloids; fortunately, the tannin in coffee combines with many of these to form an insoluble and therefore innocuous substance. The food which is eaten simultaneously may also greatly retard the action of poisons and give the victim time to summon medical assistance; and if the stomach already contains foodstuffs which promote an abundant secretion of gastric fluid, this may in some cases so weaken or transform the poison that it fails to kill. And that brings us to the query: How *does* a poison kill?

Those agents which destroy life rapidly affect the nerve-centres, the muscles, or the network of veins and capillaries which distribute the vital stream. Slow poisons, on the other hand, produce a profound change in the equilibrium of our glandular system. The physical theory depicts the action of a toxic substance as one of interference with the normal endosmosis, capillary action, and secretion of the glands. Some physicians believe that it produces a reaction which forms other compounds than those upon which the balance and cooperation of the countless organs, cells, nerves, and muscles depend. For instance, we know that there is a constant slow exchange of fluids through membranes and capillaries. The myriad cells obtain their nourishment by drawing it from the blood through the arteries, and return waste matter in the same manner. This constant movement is the basis of life. If its rhythm is broken, slowed down, or stopped, life ceases to be. Morphia, as an example, retards this endosmosis and thus produces the various well-known symptoms of increased mental activity, followed gradually by an overpowering desire to sleep, and finally a complete cessation of the indispensable work of the kidneys, pancreas, and intestines; so that a general auto-intoxication supervenes which so clogs the organism that at last death results.

Chemists, on the other hand, suggest that all poisons interfere with the normal hematosis; especially compounds of lead, copper, arsenic, antimony, and mercury, which combine with the oxygen in the blood, form deposits in the vital organs, and cause death by a complete change in the glandular secretions.

A third theory has made its appearance, however, because many of the most violent poisons destroy life without themselves sustaining any alteration in their composition and without apparently causing any discernible change in the organs. Strychnine, morphine, and nicotine are such alkaloids. An explanation has been attempted, but as yet its partisans are in the minority. This is that the toxicity of a substance depends upon the number of free ions accompanying each molecule, and that its inimical action is due to an ionization which destroys the structure and balance of living cells.

Whatever the true explanation may be, at all events poisons kill by affecting the normal function of glands, muscles, or nerve-centres. It is a fascinating but dangerous subject, into which I cannot probe more deeply, since my intention is not to suggest efficient methods for committing murder, but to describe the manner in which the police experts succeed in tracing the presence of poison in a body. Yet it may not be without interest whilst reviewing the poisons most frequently used, to mention briefly some of the antidotes which may be employed successfully. Unfortunately, these are efficacious only at an early stage, before the substance has attained the network of capillary arteries. Since the characteristic symptoms do not make their appearance until this has happened, an antidote is generally given in time only in those cases where either the victim or his family suspect that poison is being used with criminal intent.

It is impossible in a short résumé to give a complete list of toxic agents, but the following are those with which the experts usually have to deal:

Poisons acting directly on the blood are carbon-oxide, bioxide and dioxide, cyanic acid, sulphydrate of ammonia, sulphuretted hydrogen, phosphorus, arsenic, and alcohol.

Plasmic poisons are nitrites and nitric vapours, intravenous injections of silver, and continuous injections of weak metallic solutions.

Paralyso-motor poisons: curare, calabar bean, aconite, circutine.

Spino-reflex: strychnine and cantharides.

Cerebro-spinal: chloroform, ether, and opium.

Nervo-muscular and muscular: digitaline, antimony, veratrine, salts of potassium, barium, copper, mercury, and lead.

White arsenic holds the first place among these, although the symptoms of arsenic poisoning are unmistakable and the presence of the metalloid can be determined years later in the viscera.

Arsenic has always attracted criminals, probably because it can be given in cumulative doses, and also because it can be easily procured, since arsenic enters into the composition of numerous germicides, vermin destroyers, and colours. Some ingenious methods have been invented for its administration by criminals. A classical example is the manner in which that terrible woman La Voison employed it. She steeped the linen of the victim in a solution of arsenic. Thus the poison slowly but continuously entered through the skin.

White arsenic, known to chemists as As_2O_3, first produces spasms and sickness. An unquenchable thirst follows upon the attempts of the stomach to reject the poison. Extreme weakness supervenes. The features become haggard, the heart's action irregular. The extremities become cold and clammy, and the face assumes the characteristic cyanose (blue tinge). Death results, according to the dose, within a few hours or after several days. These symptoms and others which I have not described resemble Asiatic cholera. When the poison has been given in repeated small doses, the method preferred by criminals, there is one infallible sign always present; the skin is covered with small red blotches. Furthermore, a constant irritation of the extremities manifests itself, and the muscles of the legs become atrophied (arsenical polyneuritis). It has been definitely established that arsenic destroys the red corpuscles of the blood. Since the poison is assimilated slowly, a gelatinous preparation of iron hydrate ($CFe_2O_6H_6$) will transform the various oxides of arsenic into insoluble iron arsenate. This antidote must be given in repeated doses of eight to ten grammes in water sweetened with sugar. If no iron hydrate is handy, magnesia diluted in twenty parts of water and given every ten minutes will also prove efficacious.

The first care of the laboratory experts, if arsenic poisoning is suspected, will be to examine what remains of the food and drink of the victim. The apparatus invented in 1838 by James Marsh, an arsenal employee, whose hobby was chemistry, is still one of the most sensitive methods known even to-day. It will infallibly reveal traces of arsenic many years after the death of the presumed victim. By means of this apparatus, which has been, of course, considerably perfected, a characteristic metallic ring is formed in the glass test-tube if arsenic is present in the organs of the victim. A similar process is also used for antimony.

Strychnine, a dreadful poison, comes next as a favourite agent for murder. Strychnine and its sister alkaloids brucine and igasurine are obtained from the fruit of a plant known as *Strychnos nux vomica*. The curare used by South American Indians to poison their arrows is distilled from creepers belonging to the same strychnos group. Three grains of strychnine is a fatal dose. Since the taste of the white crystalline powder is extremely bitter, criminals generally disguise it by dissolving the drug in coffee. In the recent Byfleet poisoning case, in which I acted as interpreter to the Frenchman Vaquier throughout the trial, the murderer had mixed a quantity of the alkaloid with bromo-salts. The symptoms of strychnine poisoning manifest themselves within thirty minutes. First a vague inexplicable terror assails the victim. Soon after the characteristic tetanic spasms supervene, the body is bent like a bow, resting only on the heels and head; these spasms increase in violence from minute to minute, until the victim finally dies of asphyxia resulting from the permanent contraction of the muscles controlled by the spinal nerve-centre. Ipecac and apomorphia should be given immediately as vomitives. Strong black coffee and tannin are excellent antidotes, since they render those traces of the drug which may still remain in the stomach and intestines insoluble, by transforming it into tannate of strychnine. Adrenalin, chloral, or chloroform should also be administered to combat the tetanic spasms.

The poison is not destroyed by the putrefactive processes and can be discovered several years after death. The methods employed for this are those perfected by Graham and Hoffmann. These chemists discovered that organic carbon has a curious affinity for the alkaloid. The viscera, liver, and kidneys are treated with oxalic acid. Animal carbon is then added to the solution which now contains oxalate of strychnine. It is thereupon filtered, mixed with rectified alcohol, and heated to boiling point. The boiling alcohol combines with the strychnine which the carbon has fixed. The solution is again filtered, the alcohol evaporated, and potassium added to liberate the alkaloid. There are many other methods, but none are better or simpler.

Opium and its satellites heroin and morphine have been, and are still, frequently used by poisoners. In the Middle Ages infusions were made from Oriental poppy heads. To-day the more potent alkaloids, although their sale is forbidden by law, are obtained from drug pedlars and utilized for criminal purposes. Their chief advantage lies in the ease with which they can be mixed with food or drink. Fortunately, their presence in the body can be easily detected. The symptoms they produce are, first, a period of extreme excitability, followed quickly by an invincible desire to sleep. Strong coffee, tea, or tannin will again render the drug insoluble. If the poison has already reached the blood, atropine is an excellent antidote.

Atropine, veratrine, and aconite are sometimes utilized by criminals, but they are not so easily obtained, and the new method of micro-photography reveals their presence in the organism long after death.

Finally, I may mention cyanide of mercury, which is one of the most violent poisons, since it combines with the hydrochloric acid in the stomach and becomes what is commonly known as prussic acid. The electrolytic method of Maayenson-Bergeret is employed with success by the police experts to trace cyanides. Against the instantaneous action of this poison little can be done, although albumen — in other words, the white of several eggs beaten in water — and calcinated magnesia constitute excellent antidotes for most of the toxic minerals.

CHAPTER VII

FORGERIES AND THEIR DETECTION

PERHAPS as important as the swift identification of ink and paper is the ability to state definitely the age of a document, letter, or message. Many times the success of an investigation or the life and liberty of an accused have depended upon this vital point. We all know that the paper upon which newspapers, for instance, are printed becomes yellow if exposed for a time to daylight; and this change of colour is more rapid if the sun's rays have reached it. But there are infinite gradations in the deterioration of such paper even, and these variations have been carefully noted. Spanish periodicals, such as the 'Heraldo de Madrid,' become yellow in sixty hours. French dailies vary. The 'Matin' and the 'Journal' also age quickly. The 'Gaulois' is a better quality of wood pulp and remains white for weeks. English newspapers are generally printed on paper which will resist the action of light for months, although some of the evening editions, intended to be scanned and thrown away, are of inferior cellulose. This broad basic principle has caused the laboratory experts to evolve tables which indicate the quality and probable age of a paper according to its appearance. The reason for such apparently useless precision is that criminals often tear the white margin from a newspaper and write what may be a message of vital importance on it. And the question may arise: From what newspaper was it torn? If from the 'Times' or the 'Gaulois,' the criminal was probably an educated man; whereas, if the featureless scrap came from a revolutionary journal, it is again an indication which sends the detectives searching in a totally different direction. But the colour or discolouration alone is only a rough superficial method at best. The scientists have gone much farther. The chemical composition of every known paper in the world has been ascertained, and the appearance under the microscope of each one photographed and classified according to type. Sherlock Holmes, in the Baskerville mystery, pointed out that certain words had been cut from a 'Times' leader article and explained that the leaded bourgeois type of the 'Times' was easily to be recognized, and differed totally from the slovenly setting-up of an evening edition. That applies to the composition of paper even more. There is as much difference between the smooth surface of the Continental 'New York Herald' and the rough texture of a Berlin 'Tageblatt' as there is between the feel of wood and steel. Modern paper is made from cellulose — that is, the pulp produced by chemical action or hydraulic pressure from the wood of poplars, or conifers such as white pine; from straw, alfa, jute, cotton, hemp, and linen or flax. Naturally the molecular structure of each pulp is quite distinctive and its reaction to chemical tests very characteristic.

As with everything modern, the necessity for manufacturing in bulk and quickly has caused superficial appearance and cheapness to become of greater importance than quality and resistance to the ravages of time, and writing-paper is no exception to this rule. When parchment was first superseded by paper, only linen, flax, and hemp were used to make it. Such paper, used exclusively until the eighteenth century, is at once recognizable by its appearance, and ink assumes a different colour on its surface from that on the more porous substitutes. It is far more difficult to differentiate the various papers made of other substances. Fortunately, there is the high-powered miscroscope under which their fibrous structure becomes clearly visible. As with the agent used to trace words on paper, so with paper. Speed in an investigation is essential, and in order that the expert shall not waste time making lengthy and minute comparisons, hundreds of microphotographs have been prepared and arranged in order of frequency. He can thus find immediately the characteristic appearance of any fibrous pulp in the tables which most of the police laboratories possess.

It is hardly necessary to insist on the importance to an investigator, when searching for an indication which may lead to the criminal, to be able to state at once and with certainty that a letter, a note, or a document, which may be a forgery, was written only some hours, or on the contrary several years, previously; that the ink was of a kind manufactured by a certain firm; and that the paper is of such and such a type. Wills, assignments, letters containing threats — all manner of things may become incontrovertible evidence against a malefactor because the paper and the ink can be traced to their source or similar substances found in his possession. Only lately a piece of paper which had been used as a gunwad was identified as having been torn from a postcard and the mutilated card found in the pocket of a poacher. This trifle completed the chain of proof against him and deprived the man of his liberty for twenty years.

There is an enormous difference in the appearance of various types of paper when magnified. That made of cotton is composed of narrow regular filaments curving right or left. These threads are transparent and have a characteristic hem at the edges, caused by a cavity known as the 'lumen.' Linen fibres are round or polygonal, the central hollow is narrow, but its dimension regular. The threads of jute are short, very pointed; the sections transparent and free from opaque knots; the surface alternately broad or narrow. Chloro-iodine of zinc will cause these fibres to become a violet-blue. Pine cellulose varies according to whether it was made from the spring or autumn growth. Spring fibres are long, broad, twisted, and thin, with rounded, bevelled ends. The autumn growth is broad, much thicker, and striped, with pointed ends. Poplar cellulose has very short fibres ending in long points. They are hollow and the extremities open. The threads of straw are thin, cylindrical, and can be coloured blue if bleached, or yellow if not.

Alfa is always comma-shaped. Manilla hemp reveals long, thick, jagged filaments, which become pink under the influence of chloro-iodine of zinc.

Specialists in forgery, as I shall explain in detail, when they have bleached out or erased a word or a phrase, reconstruct the ragged surface of the paper. It is pretty certain that they will be compelled to use a thin flake of wet paper for this purpose, and the difference in the two papers not only proves the fraud, but the composition of the paper used by the forger may become a valuable indication. It may be that he has found a certain kind eminently suitable to his purpose; therefore, when again and again the microscope reveals the same molecular structure, this is not only proof that he has committed more than one forgery, but it may even lead the police to him. Frequently mere micrographic analysis is not sufficient and the composition of the paper is definitely ascertained by reagents. The following, by

Sillinger, is the most sensitive. Two solutions are prepared:

Distilled water	10 c.c.
$(NO_3)^2Ca_4N_2O$	20 grammes

H_2O	18 grammes
KI	1 gramme
I	0.20 gramme

Three cubic centimetres of the first solution are added to the second, which must be preserved in a yellow glass bottle. Paper fibres tested with this give the following results:

Jute and hydraulic wood pulp become yellow.
Bleached pine cellulose: a dainty pink.
Unbleached pink cellulose: light yellow.
Poplar cellulose: violet-blue.
Alfa and straw: blue.
Rags: orange-pink.
Hemp treated with iodine and sulphuric acid becomes green.

Thus the colour reaction added to the microscopic examination makes the identification of a paper absolutely certain.

There was a case just lately which demonstrates clearly how modern laboratory experts assist the police to solve a mystery which twenty years ago would have been considered hopeless.

The body of a man was discovered lying on the shore of a little island in the Mediterranean, after a terrible storm. Identification was impossible, because the body had been in the water several weeks and had been terribly mangled by constant pounding against the rocky shore. Nevertheless, the pathologists found traces of poison in the viscera. There was just a chance that it was only suicide, but the police inclined to the theory that a crime had been committed. Whilst examining the ragged clothing, they discovered a sodden, discoloured sheet of paper which had slipped into the lining of the jacket through a hole in an inside pocket. Although the salt water in which it had been immersed so long had eaten away all traces of writing, the shape and size indicated that it had once been a letter. The precious sheet was laid on a piece of glass and a solution of hydrochloric acid and water passed over the surface with a soft camel's-hair brush. Then the process was repeated with a saturated solution of ferrocyanide of potassium. This caused the bleached writing to appear again in blue, because the iron (SO_4Fe) present in most inks, sinks into the pores of writing-paper and by exposure to the atmospheric oxygen becomes insoluble. The first treatment of the surface with hydrochloric acid rendered this residue of iron more sensitive to the action of the ferrocyanide, which then combined with the minute traces and formed Prussian blue.

When this reaction had been obtained, the letter was well rinsed in pure water, blotted, and slowly dried; photographic plates sensitive to blue were then used under an appropriate colour screen, and the resulting prints gave a clear, readable message. It was an assignation to a house situated in an ill-famed part of Toulon. The name of the street and number were given, and the letter, which, furthermore, contained threats and a demand for money, was signed with a woman's name. The investigation now progressed rapidly. The mangled body was found to be that of an ex-naval officer who had mysteriously disappeared. The woman and her accomplices were traced, and it was proved that the victim had been murdered and thrown into the sea with a heavy weight attached by a rope. But for the storm and the action of the salt water on the rope and flesh, it might never have come to the surface. The criminals were utterly dumbfounded when photographs of the letter were produced. This letter had led to a bitter quarrel between the victim and the woman who had enticed him to the house. It had fluttered to the floor when he collapsed, writhing in pain, after absorbing the poison she had mixed with his drink, and one of the woman's accomplices had picked it up and stuffed it into his pocket, intending to destroy it later. He and two other ruffians, who had waited in another room for their signal, had then despoiled the dying man, taken his clothes away, and, in order to make identification, as they thought, quite impossible, should the body ever come to the surface, had dressed him in the trousers and jacket belonging to one of them. By an irony of fate, they unwittingly used the very jacket into which the fatal letter had been thrust. The victim's clothes had then been burnt and with them, as they thought, all traces of their crime. It seems incredible that so fragile a thing as a letter cannot be utterly destroyed by long immersion in salt water or by fire, but so it is. Even a burnt letter can be photographed and read.

In the same manner as for paper, the composition of inks and the time which has elapsed since words were written can be determined with absolute precision, as I hope to show later; but besides the various commercial inks there are the chemical solutions often used by criminals, which become visible only when the right reagent is applied. These secret inks are all based on chemical affinities and are countless. Some of those frequently employed are:

Salicylic acid	1 per cent solution
Phenic acid	1 per cent solution
Resorcine	1 per cent solution
Benzoic acid	1 per cent solution

A message written with any of these fluids between the lines of an innocent letter is quite invisible when dry. By sponging the apparently empty spaces with a one per cent solution of perchloride of iron, the first substance gives clear blue-green writing, the second blue, resorcine red, and the benzoic acid pink. Even antipyrin makes excellent invisible ink, a fact of which convicts were not slow to take advantage when this drug could formerly be obtained from the medical officer as a cure for sick-headaches. I am afraid that aspirin, which is acetyl-salicylic acid, can be used in the same manner, but, in England at least, the special blue tint of prison letter-paper makes the use of invisible ink impossible. Beta-naphthol is often used abroad, for although quite invisible it needs only sugar and water to bring out a secret message in brilliant red.

A very clever trick has been invented lately in America. I dare not give the formula, but a cheque or an agreement signed with a certain chemical ink, which can be carried in a fountain-pen, appears to be quite normal at the time. The criminal who intends to swindle people by means of this ink carries in his vest pocket a tin containing a tiny sponge soaked in another solution. Whilst feigning to blot his signature he dabs this sponge over it before pressing down the blotting-paper. Twenty-four hours later nothing is left of the writing thus treated. Fortunately, the experts have already discovered a method whereby, if applied within a month, it can again be revealed.

The composition of inks and pencils has also become a special branch of criminal investigation, and precise science and specialized knowledge are at last replacing the methods of deduction to which such wide publicity has been given by writers, ancient and modern. The reasoner, who depended entirely upon the power and subtlety of his brain and perhaps upon a natural aptitude for solving riddles, is being dethroned by silent, efficient, unerring instruments wielded by a galaxy of savants, who are proving slowly but surely that, although they may not be able to point an accusing finger at the guilty criminal, for that is the work of the detective, they can at least place such unquestionable proof and so many valuable clues at his disposal, that his work, from haphazard, becomes methodical and certain. Thus the experts not only ensure the rapid and efficient unravelling of a crime problem, but in time they will succeed in making a miscarriage of justice a rare occurrence. The community will be protected by the laboratory experts from the criminal, and also from the police, who sometimes, in their eagerness to punish swiftly a malefactor and in their desire to stamp out crime altogether, may — and that is an inevitable consequence of their unceasing warfare against evil-doers — deprive for a time a guiltless citizen of his freedom.

The point has been raised lately: How far may the police go when questioning a man or a woman upon whom suspicion has fallen? That question is answered by the scientists. When they have given the police the results obtained with microscopes, cameras, and chemical reactions in an investigation, it is no longer a suspicion, but a certainty, that has none of the fallacies of human reasoning and deduction. If the laboratory report states, for instance, that a bullet was fired from a thirty-eight calibre revolver, and if such a weapon is found in the possession of a man whom other circumstances link up with the crime, then whatever the questions which may be asked or whatever statements are obtained from this man, they are in the interests of the public and justice.

The greatest enemy of true justice is circumstantial evidence. In most cases the men working in the laboratories know nothing of the crime itself; they are asked to report only on the results, carefully checked, which their instruments give them. Therefore, their decisions are absolutely impartial. They care little whether those reports prove a man's guilt or innocence, and are not interested in the number of convictions the police obtain.

I have already explained that of all the departments which specialize in only one branch of research, that which deals with a man's identity comes first. It includes the Bertillon measurements, finger-prints, footprints, and the stigmata of all individuals who have committed an offence. Next in importance is the department which has made a profound study of the written word. I have purposely used that expression in preference to 'writing,' because it is not merely handwriting and forgery which the experts examine. They have subdivided their department into sections in which everything that appertains to writing is analysed. The numerous kinds of ink and the manner in which the age of a document may be ascertained with certainty; the countless compositions of paper and the manner in which each reacts to a certain type of ink are all classified. Moreover, the inks which are not to be found commercially, but which the criminals manufacture for various reasons, some of which I have described, are noted and tabulated. Inks that vanish after a few minutes or hours, and inks that leave no trace, but can be rendered visible by reagents. They have perfected methods by which a document, sodden with salt water, from which all writing has faded, can nevertheless be read; and they have examined, photographed, and classified every known make of pencil.

When one hears of letters, messages, or memorandums becoming valuable clues, one is tempted to visualize these as written with a pen. Generally, however, the criminal prefers a pencil; and upon the swift and certain identification of the kind of pencil used, a complex and difficult investigation may depend for its final link that will complete the chain of proof. Pen, paper, and pencil are the three enemies of criminals, be they thieves, blackmailers, or murderers. This department has even evolved a means whereby a letter, of which nothing but a burnt flake of ash is left in grate or stove, can be read; or, if that is impossible, the composition of the paper and the agent used for tracing the obliterated words can be determined.

Handwriting identification is work which the scientist dislikes intensely. It has been established long ago that no expert can state with certainty whether a document was written by the person with whose handwriting he is asked to compare it. There may be similarities, and these he points out. There may then be found the additional evidence that the paper, ink, and pencil are the same. But the writing alone should ever be deemed insufficient. The great Bertillon had always refused to commit himself to any definite statement where writing was concerned; and because, through patriotic enthusiasm, he departed from that rule, and, unfaithful to the principles of a lifetime, declared in the Dreyfus case that the famous *bordereau* had been written by Dreyfus, the last years of his great career were overclouded by remorse. As everyone remembers, it was later proved that the penman had been Esterhazy. But the modern microscope, camera, and spectrograph make no mistakes. The composition of an object can be determined without shadow of doubt.

Pencils are divided roughly into those whose 'lead' is made of a mixture of carbon, silicate, and iron, writing grey black; graphite, silicate, and iron, writing a soft deep black; coloured pencils made of pigments; and the copying pencils generally composed of aniline colours, graphite, and kaolin. It is, of course, much more difficult to recognize different types of pencils than to identify inks. A variation in the pressure will cause a hard carbon pencil to write almost like a soft pencil made of graphite; but if the lines are illumined obliquely, those which are graphite will show a discontinuity under the microscope which is more apparent even at those very spots where the writing appears to be thick and brilliant. Pencils which contain silicate mixed with graphite will leave behind tiny particles of silicate evenly distributed over the thick and thin strokes. This deposit makes it possible, when greatly enlarged, to determine whether a line was added after the original contents of a document were written, for the traces of silicate will be superposed. Curiously enough, such a test cannot be applied to copying pencils or pencilled words crossing others written in ink. Although it can be used efficiently where only ink was used, even the microscope will not reveal which was written first and which added later, when a pencil was employed.

In order to determine at once the type of pencil used, the expert must analyse the proportions of carbon, graphite, silicate, and iron; or, if dealing with copying pencils, the proportion of aniline colour, silicate, and mineral. An excellent method is that perfected by the Lyons laboratories. The writing is first treated with acetic acid (eighty per cent) or nitric acid. A solution of ferrocyanide of potassium is then applied. The colours obtained from the various pencils are strongly marked. Faber pencils treated with nitric acid and ferrocyanide give a brilliant emerald-green reaction; treated with acetic acid, the result is a greenish-blue which after three hours becomes distinctly blue. The presence of titanium in the pencil will produce a decided change in the colour. Moreover, in some pencils there are minute quantities of chlorine present in the carbon or graphite, which make it possible to recognize their origin. A drop of diluted nitric acid and nitrate of silver will become opalescent, thus revealing the chlorine.

Lately the spectrograph has been much used in preference to the microscope, since a comparison of the photographs of spectrums is a surer method, and, furthermore, these can be utilized as evidence in court. Modern pencils vary chiefly in the proportions of graphite, silicate, and iron, and this difference is forcibly shown in the number and intensity of the lines on the spectrograph. The decided difference in the appearance of a stroke made with various pencils can easily be seen under a microscope. When in addition analysis and photography prove that the chemical composition corresponds to the classified type, it may be taken as proof that a document was written with such a pencil. It has been ascertained that whereas inks containing gall will become insoluble by exposure to the air after a short time and therefore useless for copying, which is already a valuable indication of the probable age of a document, pencils composed of graphite, aniline colours, and kaolin will give a good copy at any period; therefore, other tests must be applied in order to ascertain when and with what substance a letter was written.

There are many varieties of copying pencils, but a simple method makes it possible to discover quickly the type to which the writing to be examined belongs. A globule of water is dropped on a chosen spot, and its action, which varies with the proportion of graphite and kaolin, carefully noted. Where kaolin predominates, the writing is more brilliant than when there is an excess of graphite. The intermediate shades are determined with Osborn's apparatus, or with the assistance of the double prism and microscope. Moreover, the colouring matter in the pencil is dissolved by the water. In some cases this reaction is instantly visible; in others several minutes pass before the water becomes even tinged with the pigment.

Tables have been established where all these characteristics are classified, and micro-colorimeters are used for comparison in Osborn's apparatus, which is roughly as follows: The ends of two separate metal tubes are so adjusted in a box containing a double prism that the light from the same lamp passes through both. Some of the water coloured by the dissolved aniline is placed over the lens of one tube, and the various test solutions with which it is to be compared are held in turn before the other. The double prism causes each image to fill only half the field of vision, so that the two colours are seen side by side. In each tube is a slot for the insertion of Lorerbond's colorimeter, which is composed of a series of numbered tints. Every number corresponds to a specific reaction of water and aniline. It is thus a simple matter to ascertain which type of pencil was used for the writing that is being examined. A final test is then applied, which, as with black pencils, is again the reaction of the iron, graphite, and pigments, treated with acetic acid and ferrocyanide, and examined under a powerful microscope. As an example — Swan pencils No. 18 give a pale yellow reaction which bleaches quickly to grey white; Hessin's pencil No. 13, pale green — changing to olive green; Faber No. 7, pale green with light yellow ring; Eagle pencil No. 5, pale green, changing slowly to sea-green. Thus each type can be determined with certainty.

Perhaps an instance of how this subtle analysis was applied and brought a ruthless criminal a long term of imprisonment may serve as an illustration. A daring robbery with violence had been committed, and two men were suspected of the crime. The police did not arrest these men, but contented themselves with keeping them under observation. They were convinced that the crime was only one of many which had been planned and financed by a 'fence,' a master criminal who directed operations and arranged for the sale of the loot. Three notorious receivers were suspected, but no definite evidence had been found thus far to show which of them was the man the detectives had long sought to capture. Any untimely action, any false move, would alarm the fellow and give him time to destroy or hide the stolen property. What was needed was a certain clue to his identity — and a pencil gave them this clue.

The officers who constantly shadowed the footpads had observed that they frequented a tavern of evil repute and that they went there daily at the same hour. Evidently it was thus they communicated with their leader. A detective thereupon managed to mingle with the ruffians lounging at the bar, and saw the innkeeper pass a note to one of the criminals. The fellow glanced at the contents and then immediately tore the paper to

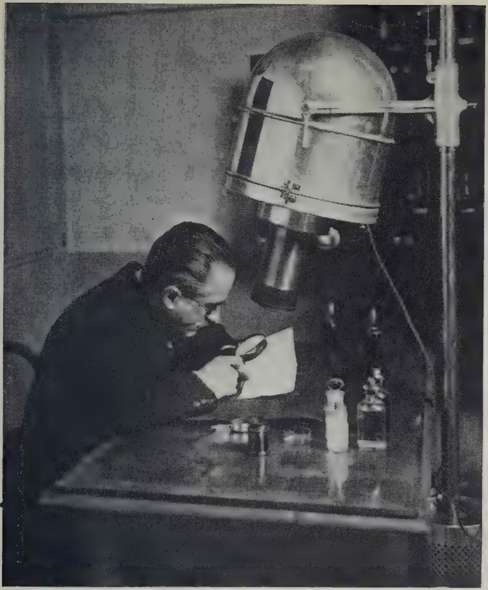


Fig. I. The ultra-violet-ray lamp

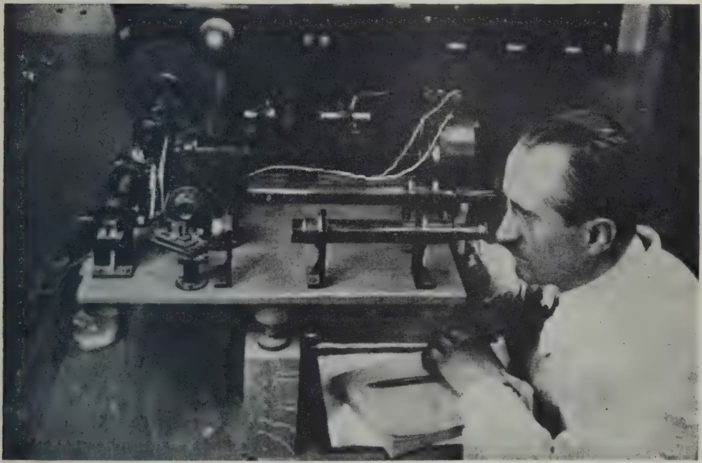


Fig. II. Osborn's apparatus as used to-day

APPARATUS USED IN DETECTING FORGERIES

shreds and cast them — as he thought — into a spittoon. But they had only fallen on the edge, and a few minutes later the detective dropped a handful of cigarettes, and whilst retrieving them also gathered up the precious pieces of paper. The message was in cypher and had been written with a pencil. The laboratory expert decoded it, and thus learned that already the mysterious leader feared that the police were watching, and advised his two accomplices to leave the town at once without attempting to communicate with him. The paper and writing were analysed. Curiously enough, the pencil which had traced the words was a No. 4 Zodiac copying, which is not often met with, and the paper was made of exceptionally fine linen pulp, and came from a well-known factory in Paris. A clever and incredibly rapid investigation proved that one of the suspected receivers, a man who carried on a covering business as an importer of Eastern carpets, had bought such paper. Moreover, several memorandums obtained from him by a ruse had been written with the same Zodiac copying-pencil. He was thereupon followed to his secret storehouse and arrested just as he was preparing to set fire to it. The evidence found there sent him and his accomplices to prison for many years.

This short description of the methods evolved for dealing with paper and pencils will make more easily understood a résumé of the manner in which forgeries are detected.

The great Cardinal Richelieu once said: ‘Give me two lines of any man’s handwriting, and I’ll hang him.’ No doubt Richelieu had expert forgers at his disposal who could alter, erase, or add to these potent two lines, until they became a deadly weapon in his supple hands. Many people believe that forgery is a modern invention, but that is not so. The Greeks, Romans, Egyptians, and Assyrians were already efficient in the art of altering writings, and in Memphis, Sparta, Athens, and Babylon there were specialists who erased and bleached manuscripts. They generally left certain parts intact, and filled in the artificial blanks in order to transform the original into something totally different. Thus the 'Judaic Antiquities,' written in A.D. 85 by Josephus, the Jewish historian, were transformed into a species of treatise in favour of the newly born Christian religion. At that time forgery was chiefly used to mutilate religious documents. Saint John, towards the end of his Apocalypse, denounces forgers, and threatens them with the Divine vengeance. Yet his own writings, like so many others of that time, were probably altered and modified to suit the contending factions.

In the Middle Ages, more than at any other period, this vandalism was constantly practised by the monks, who were adroit forgers, and produced the palimpsests. Philosophical treatises, alchemists' formulæ, and esoteric theories were so travestied by erasures and additions that they could be used by the fanatics of the time to prove the heresy of those whose beliefs clashed with the teachings of the Church. Modern chemistry has exposed many of these frauds, by rendering bleached or erased writings visible. Thus, under ancient Latin versions of the Bible were found a thesis of Cicero in defence of Roscius of Ameria, the fables of Stygen, unknown pages of Pliny, fragments of the Theodosian Code, and dissertations by Euripides.

Since then, of course, the art of the forger has progressed to such an extent that the experts in the numerous police laboratories have been compelled to devote much of their time to the elaboration of instruments and methods capable of dealing efficiently with this subtle branch of crime. The forger has realized that the success of his labours depends on a thorough study of the two basic factors of the written word: the paper and the ink. Although paper is made of many substances, there is one important operation in the manufacture of writing-paper which is a constant menace to the forger, and that is the glazing. Glazing is indispensable if the paper is to be homogeneous and if it is not to absorb the ink as blotting-paper does. The usual method is to steep the sheets destined to become writing-paper in a hot solution of gelatine, generally about half an ounce of gelatine to a pint of water, to which a little alum has been added. When the sheets are dry, they are passed between steel rollers or placed in an hydraulic press. The surface of the paper thus becomes smooth and even. The danger of this glazing to the forger is obvious. It is to the artificial surface that the ink adheres, and the chemicals he uses to bleach or efface writing naturally attack and dissolve the glaze, exposing the absorbent surface of the actual fibres of which the paper is made. Were he to write on this, the ink would spread as it does on blotting-paper. His first care, therefore, after effacing the ink, is to cover that part with a substitute for the original glaze. For this he uses flour paste; resin, heated and dissolved in alcohol; fecula, and alum; or a mixture of soap, powdered resin, and alum dissolved in warm water. These substitutes for the original dressing are applied with a tiny brush where the razor has shaved away the ink, or where the bleaching has eaten into the texture. A hot iron is then passed over the whole surface of the paper. Care and practice are essential, but the expert forger is a past-master in these details. Since erasure also diminishes the thickness of the paper, the application of paste or resin levels the hollows. When thoroughly dry, the forger fills in the blanks with a pen and ink similar to those with which the remainder of the text was written.

There is another detail as important as the glaze. This is the colour of the paper. Most of the commercial types are treated with cobalt, in order to neutralize the yellow tinge of the fibres, since blue, added to the yellow cellulose, causes the paper to appear white. Unfortunately, cobalt is not easily deteriorated by acids or alkalis, whereas mauve, pink, or cream paper at once loses its colour.

The first care of the expert when a document is submitted to him is to discover the type of forgery that he is dealing with. These have been carefully classified and analysed. Freehand forgery is not widely practised, except for imitating a mere signature. The reason is obvious. With the exception of a gifted few, it is almost impossible, without long and arduous practice, to imitate another's handwriting so perfectly that the document will pass muster. The modern investigator completes the up-and-down strokes by ruled lines several inches long. The document is then enlarged, and the slopes compared with an authentic specimen. The angles are also measured by very sensitive instruments. The forgery thus immediately becomes apparent. Furthermore, no matter how skilful the criminal, he is compelled to write slowly, and thus causes the letters to waver very slightly, but just enough for the microscope to reveal it. And there is the retouching. A forger always improves the shape of certain letters, and this retouching becomes very apparent under a powerful lens.

A better method is the traced forgery. In order to imitate another's writing, the criminal must naturally

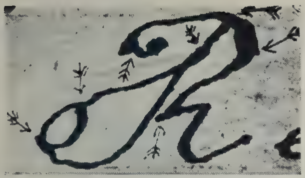


Fig. I. A microphotograph of a letter, showing wavering and retouching

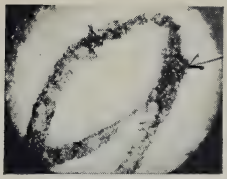


Fig. II. A 7 that was changed to a 9

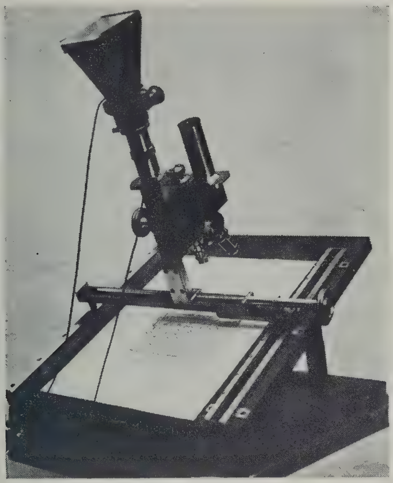


Fig. III. The microcamera invented by Dr. Locard which will checkmate the forger

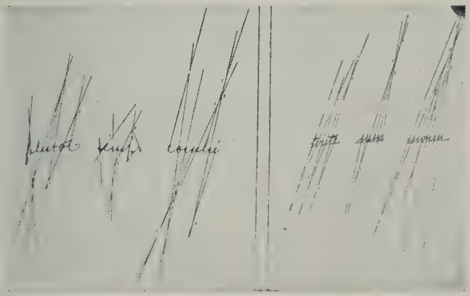


Fig. IV. The Dr. Locard test. When continued, the difference in the slope of the up and down strokes is very evident

METHODS INVENTED BY DR. LOCARD FOR DETECTING FORGERIES

obtain letters or documents written by the person he intends to defraud. He attaches several of these against the under side of a pane of glass placed in an arrangement similar to a photographer's retouching desk, fixes a sheet of paper on the upper side, and illuminates both by transparency. He then traces the words necessary for his faked document from the originals, until he has the complete text. This trick was formerly efficient, but today it is a simple matter to expose it. Words taken here and there do not fit when enlarged. We all have our characteristics. Some people begin with longer and more accentuated letters, and dwindle towards the end of the word or phrase; others do the opposite. Some begin heavily, and finish lightly; some vary the slope. It is obvious that if words are taken here and there, and copied exactly to form a sentence, none of these characteristics will be continuous.

A method which cropped up for the first time in Geneva was much more ingenious, and at first deceived the experts. This is the cut-out letter trick. A notary named Guyard had determined to cheat his brother's family of their inheritance when the brother died. To this end he collected countless letters, from which he cut the words he needed to compose a will in his favour. These words were gummed on a blank sheet and photographed. Therefore he went to an adroit but unscrupulous engraver, who lithographed the will, using a certain kind of ink, and produced a perfect document which was accepted as authentic by the courts. But the engraver at once began to blackmail the dishonest notary. His demands became so exorbitant that at last the notary refused to pay. When the engraver realized that nothing further was to be obtained, he fled the country, but before doing so sent blocks, model, and proof-sheets to the police. The notary was sentenced to ten years' hard labour. Since then this method has been used again and again in various ways, but the laboratories are now on their guard, and by applying the same tests as in the case of traced documents, can immediately render the forger evident. Furthermore, the variation in the size and vigour of the words is an infallible means of proving that a forger has been at work.

Much more dangerous are the criminals who erase or bleach words here and there, and fill in the blank spaces thus produced by carefully chosen words or phrases which completely transform the original meaning.

It would be too long to go into the history of ink, but it is very, very ancient. The first kind was Chinese or Indian ink. This is made of lampblack, vegetable carbon, or the colouring matter of the squid, mixed with gum to render the substance homogeneous. Later, inks composed of iron, tannin, and logwood were discovered. Modern inks are still manufactured of these substances, although many of them contain a small proportion of aniline dye.

Permanganate of potash, acidulated by a few drops of sulphuric acid, completely bleaches mineral inks, but stains the paper yellow. This tinge is eliminated by sodium sulphite or metabisulphite. Chlorine, oxalic acid, and other chemicals also bleach ink, and such solutions are constantly used by forgers. I have no hesitation in giving these details, for I shall show that it can now be infallibly proved that a figure or a word has been so treated. Unfortunately, a document is generally sent to the police laboratories only after the fraud has been discovered, when in most cases the harm is done. I should, therefore, like to suggest several methods by which it can be determined at once, without the help of an expert, whether a receipt, bill of exchange, letter of credit, or cheque has been tampered with. If a knife has been used, a small quantity of petrol poured on the paper will quickly spread where the surface is intact, but will not spread to the part which has been altered. Finely powdered oxide of copper obtained by electrolysis (every police laboratory has a stock of this, and would willingly place some at the disposal of banks), if it is lightly strewn over the paper and then shaken off, will adhere thickly where a paper has been bleached, knifed, or otherwise tampered with, but not to the normal surface. Finally, if the document is held against a powerful lamp, and examined with a magnifying-glass, the fraud at once becomes apparent, either because the paper is thinner where the forger has been at work, or, if he has added an artificial glaze, because it is more opaque there.

The police laboratory has many infallible methods besides these rudimentary tests. The first thing the expert examines is the ink. It is almost impossible for the forger to obtain an ink absolutely similar to that originally used. It may look the same to the eye, but there are several instruments which at once reveal a difference, although this difference may be due only to age or exposure to the air. One of the most sensitive instruments for detecting a variation in the ink is the spectrograph. A microscopic particle is taken by a special needle from several letters or figures. These are compared by means of double prisms, and the slightest change in the colour becomes evident. Then there is the magical ultra-violet ray. Exposed to this, not only that part of the paper which has been altered glows with a different fluorescence, but so does the ink. But the latest and most conclusive of demonstrations is obtained by a species of electrical apparatus combined with a loud-speaker and wireless valves, which is also used for many other tests. The ohmic resistance of the normal paper and ink produces a definite musical sound. When the maximum has been determined by a sliding rheostat, the current is passed through the suspected part. A difference, so minute that no other method could reveal it, at once produces a change in the whistling vibration. Bleaching or knifing is therefore infallibly detected.

When it has been ascertained that words or figures have been effaced, it is important that these should be made to reappear in order to discover what they originally were. Even this can be done efficiently and accurately. No matter how thoroughly the chemical appears to have done its work, there is still some trace of the writing left, although it may be quite invisible. But the camera can reveal what the eye cannot see. The manner in which it was first discovered that certain photographic plates are sensitive to latent deposits is curious. A German photographer one day received the visit of an extremely pretty girl whose chief beauty lay in her exquisite colouring. He exposed a number of negatives, and in order to obtain a true rendering of the tint of her eyes, hair, and complexion, he used orthochromatic plates. Much to his astonishment, when these were developed, the face was mottled on every one by stains and blotches. Under the impression that the makers had sent him a faulty batch of plates, he at once wrote to his client and requested her to sit once more. Although he sent several letters, there was no reply. Two months later the same lady called, horribly disfigured, to examine her proofs. She had just recovered from a severe attack of smallpox, which declared itself two days after the sitting. The camera had faithfully reproduced the inflammation already latent under the skin, although it had been invisible to the eye. Since then the camera has become the most potent instrument for photographing the invisible.

First of all, the photograph of a suspected document taken with orthochromatic plates will infallibly reveal that certain parts have been bleached. Furthermore, it will bring out the effaced writing. A negative is made and developed in the usual manner. This negative is then reduced, and afterwards intensified with mercury perchloride. When dry it is placed in a printing-frame, and, instead of paper, a second plate is exposed by contact. This is again developed and intensified. The process is continued until, at the sixth or seventh negative, the colourless traces of the effaced writing stand out clearly. If the artificial glaze, or the words written over it, are in the way, the paper is soaked in glycerine and photographed by transparency. This method is also employed in order to read what has been struck out by lines, blots, or words written thickly over the original matter. The work is much simplified if the ink used by the criminal is not absolutely the same colour as the writing beneath it. For instance, if a paper with yellow and red lines on it is illuminated by a ray of red light, the yellow lines will be clearly visible, but the red lines disappear. If, on the contrary, the illuminating ray is yellow, the red lines stand out boldly, but the yellow became invisible.

This phenomenon is utilized in the police laboratories by means of the chromoscope. This is, in reality, a projector with four lenses. Three are covered by suitably coloured screens, and the fourth is a normal white ray. The colours can be combined with such precision that any tint can be produced. When the right mixture of colours has been obtained, the covering ink becomes invisible, and a photograph taken with a complementary screen reveals only the writing which was hidden to the eye. This chromoscope is used to eliminate certain tints in counterfeit bank-notes, or in bringing out invisible stains on multi-coloured silk, clothing, or paper. It was recently employed in a murder case, where it was imperative to read the undecipherable postmark on a stamp. The colours were so blended that the stamp became invisible, leaving only the postmark.

Another method for reading bleached writing, based on the fluorescence of metallic inks, is to expose the incriminated document to the ultra-violet ray. Only lately this ray cost a forger his liberty. He had, indeed, used the same ink to fill in a blank space, but, whereas the authentic part had been written in a room free from dust, the forger had used an open ink-well in which minute particles of dust had settled. When the document was placed under the ultra-violet lamp and examined with a microscope, certain words and figures were seen to be speckled with the vivid scarlet so characteristic of rhodamine. These words and figures were obviously forgeries. Several men were suspected, but the investigation disclosed the fact that one of them lived next door to a dye factory where rhodamine was constantly used. Similar particles were found in an open ink-bottle and on the furniture in his room. He was arrested, and confessed.

There is another subtle method much employed by criminals. A line or a word is added in the space some people foolishly leave here and there on important papers. This can be detected by micro-photographs taken of certain spots where the up-and-down strokes of letters cross. If a line was written subsequently to the original matter, the letters cross above the upper or lower line where they touch, and the ink spreads slightly over the dry part; whereas, if the words were written in their natural sequence, the tails of such letters as *g* or *p* will always be under the up-strokes of the line *below them*. Figure V facing page 186 shows a micro-photograph of part of a will, which was contested on the ground that a sentence had been added. When the point of bisection was micro-photographed, it was seen that this was not so.

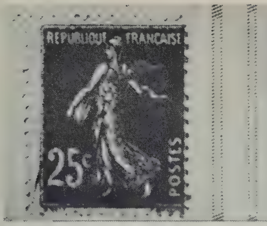
Lately typewriters have come to the front for forgeries; but machines have even more striking characteristics than handwriting, and the fraud is easily detected. During the last year, however, a famous shipping firm was swindled out of many thousands of pounds. Typewritten letters from Spain advising them of consignments of merchandise were handed to a forger by a dishonest employee. A space was always discovered in which, by using a similar machine, the criminal was able to insert 'Our agent will call and collect an advance of £250 sterling'; or, 'Please pay to the bearer of this letter £500 for customs formalities.' Since the letters were authentic, written on their correspondent's paper, and signed by the directors, the money was paid without hesitation. Now every communication bears the printed notice: 'This letter does not refer to any payment unless a special separate letter of advice has been received.'

The cleverest trick ever worked successfully recently cost a Spanish bank ten thousand dollars. A gentleman called at the Marseilles branch of a British bank and opened a small account. Excellent references were given. Shortly afterwards he asked for a certified cheque for ten dollars, payable in Spain. He bleached out the words and figures, and transformed the ten dollars into ten thousand. So far this was nothing new; but the fellow was an artist. Instead of writing the fraudulent ten thousand dollars, he used a protectograph, which printed words and figures by perforating the cheque. This not only eliminated the necessity of writing, but gave the cheque such an authentic and official appearance that it was unhesitatingly paid. Let banks beware of this latest device. Anyone can buy a perforating machine. A letter of advice in advance of all cheques, no matter how small, would be an efficient protection.

One last word about forgeries. It is an extraordinary thing that no one ever seems to take the trouble to ascertain the composition of the ink with which agreements and cheques are signed or important documents written. Yet a slight knowledge of the characteristics of this indispensable medium for our daily intercourse with our fellows would easily circumvent the cleverest forger. The fact that all inks made of gall, logwood, and iron sulphate can be bleached with ease suggests the obvious precaution everyone should take. When we buy ink we generally prefer a well-known and popular make, quite forgetting that the more popular it is, the more easily the forger can obtain the same kind. Anyone who constantly signs important documents — bankers, for instance, who deliver letters of credit and other equally potent writings — should use a special ink which cannot be bleached by alkalis or acids. Furthermore, the paper should be such that a touch of chemical would discolour it or the knife destroy its surface.

CYPHERS AND INVISIBLE INKS

Most of the methods for communicating by hermetic writings are incredibly ancient. Even primitive man of



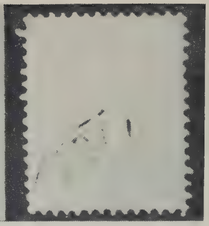


Fig. I. A stamp photographed normally

Fig. II. The same stamp photographed with special light, showing only the postmark

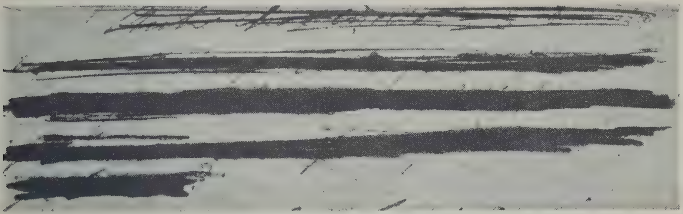


Fig. III. Part of a document in which several lines have been crossed out

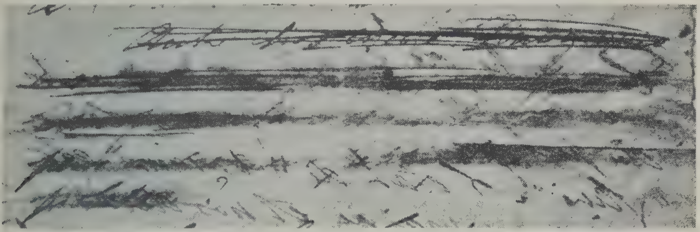


Fig. IV. Already the effaced writing is becoming visible

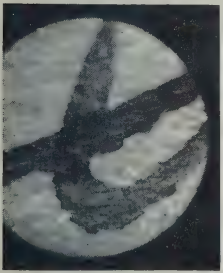


Fig. V. This shows that a line suspected to have been added passes under, instead of over, the other line

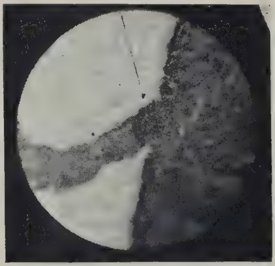


Fig. VI. This shows where the ink has spread slightly on an already dry letter

THE USE OF PHOTOGRAPHY AND CHEMICALS IN DETECTING FORGERIES

the cave-dwelling period had already elaborated various symbols for secretly conveying information to members of his tribe. Curiously enough, because the squares, circles, and triangles used by sorcerers and pagan priests as potent charms were believed to contain hidden wisdom and the formulæ of terrible incantations, they retain even to-day a strange fascination and an appeal to the hereditary superstition latent in mankind. There is something about the pentacle, the swastika, and the Chinese square which awakens deep-seated emotions intimately connected with ancient evil rituals and sacrifices. The hidden meaning in the written symbols of a language we do not understand still attracts and puzzles us, and the ability to communicate by secret signs lifts the tribe or band which uses them above the level of the uninitiated. It is this imaginary superiority, quite as much as the necessity of being able to transmit intelligence by invisible or apparently meaningless letters, signs, or figures, which makes all criminals eager to invent some method which shall be their sole and prized possession. Naturally the police experts and military intelligence departments in every country have found it necessary to classify the various systems, and to discover a means whereby their hidden meaning can be made clear. It is a trite but true axiom that no cypher was ever invented but that someone discovered the key or at least succeeded in picking the lock. It is the everlasting struggle between weapon and shield; lock, safe, and burglar. No sooner had the steel armour-plate and time-lock been evolved than the safe-breaker resorted to blowpipe, electricity, and thermite. And so with cryptographs. This is comprehensible. There is only a given number of letters in each alphabet, and their repetition and frequency can be determined mathematically.

A classical example of the manner in which a cypher message may be decoded is given in Edgar Allan Poe's wonderful story 'The Gold Bug.' When a cryptograph is submitted to the expert, the first thing he must determine is, of course, the language in which it was written.

In English, *e*, double *e*, double *o*, and *th* are frequent; and in a normal sentence *e* occurs more often than any other letter. Next comes *o*, then *th*, and so forth. In French, *qu*, *ai*, and *est* are constantly combined. Thus, if in a cypher message certain figures, letters, or symbols are met with in constantly repeated and typical groups, they are tested for words having these well-known combinations. Once a word has been obtained from an apparently meaningless jumble, the rest is quite simple. The drawback in substituting conventional signs or figures for letters is that both correspondents must keep the key handy, and this is dangerous. Most criminals prefer to use a prearranged system of inversion or transposition of the letters. We will suppose that the message is to be 'Wait for me outside the bank at nine.' This is first written thus:

W A I T F O R M E
O U T S I D E T H
E B A N K A T N I
N E

The sentence is then again set out, reading from top to bottom, like this:

WOENAUBEITATSNFIKODARETMTNEHI

At first sight this would puzzle most people. There are various infallible methods for reading such a cryptogram. To begin with, the expert applies the well-known principle of identifying his own intelligence with that of the writer. Or, if the origin of the cryptogram is unknown, his experience suggests the probable manner in which the lines were separated. The sentence is short, therefore when transposing, the criminal would evidently split up the text into at least three or four lines to confuse it more. It is only necessary to set it out in different formations, so that three, four, or five letters come under each other, to obtain the correct position of the lines. Unfortunately, criminals know well enough that this type of cryptogram is child's play to the expert. Therefore they disguise the true meaning still more by jumping diagonally or writing backwards. Very often the pages and lines in a dictionary are indicated by figures, or a stencil is utilized. Another excellent trick is to substitute a conventional alphabet for the natural sequence of the letters. As an example, *a* is written as *c*, *d* instead of *b*, and so on. In such a cryptogram it is only necessary to continue the alphabet under the letters of each line until the text emerges. For instance:

V c m g e c t g v j g r q u k e g c t g h n a The cryptogram
w d n h f . . . .
x e o i g . . . .
y f p j h . . . .
z g q k i . . . .
a h r l j . . . .
b i s m k . . . .
c j t n l . . . .
d k u o m . . . .
e l v p n . . . .
f m w q o . . . .
g n x r p . . . .
h o y s q . . . .
i p z t r . . . .
j q a u s . . . .
k r b v t . . . .
l s c w u . . . .

m t d x v. . . . .
n u e y w. . . . .
o v f z x. . . . .
p w g a y. . . . .
q x h b z. . . . .
r y i c a. . . . .
s z j d b. . . . .
t a k e c a r e t h e p o l i c e a r e f l y The real sentence

Again the criminal may use a short key, such as 2, 3, 4. With the help of this the words 'Don't answer' become:

D	O	N	T	A	N	S	W	E	R
2	3	4	2	3	4	2	3	4	2
F	Q	R	V	D	R	U	Z	I	T

A variation of this is the key-word, which may be long or short. Each letter takes its alphabetical value from the corresponding position of those forming this key-word.

Message.........	D	O	N	T	A	N	S	W	E	R
Key-word.......	F	O	R	G	E	T	F	O	R	G
Value in figures .	6	15	18	7	5	20	6	15	18	7
Transposition....	j	d	f	a	j	n	y	l	w	y

Such cryptograms cannot be resolved if the message is so short that it contains only one or two words. Naturally the first step is to determine the language used by the writer. The only efficient method for this is to classify the recurring groups of letters. Once this has been ascertained, the frequency with which the various letters are repeated is noted and compared with the scales of average which have been composed for each language, until the position and reoccurrence of a letter or group becomes the probable fragment of a word. It is a long and arduous task. The puzzle of the famous cypher employed by the kings of France was only lately solved. It had defied the constant efforts of experts for over a century. There is, however, one basic rule which can be applied to all secret correspondence. Since European alphabets are limited to twenty-six letters, any series of words must produce the same characteristic combinations and periodical reoccurrences. This principle, when applied in the manner I have briefly explained, sooner or later renders the most complex cryptogram readable.

A variant of the cryptogram much favoured by criminals is the steganogram. This is a secret alphabet, composed of elaborate hieroglyphics. These conventional signs are much used on the Continent, but are not often met with in England, except among the Romany people.

The familiar symbols which tramps formerly chalked on the walls of country houses come under the same heading. Naturally much patience and practice are required to write fluently by means of such improvised letters. Again, the same principle is applied by the experts to read these secret writings. The photograph of a conventional alphabet found on a member of a dangerous gang of German safe-breakers is a good specimen of such a cypher, and at first sight a message composed of these signs might well drive the uninitiated to despair.

Although these various methods for disguising the meaning of a message are frequently utilized by all criminals, in order to give information to their accomplices, or for noting names and addresses, they are chiefly employed by prisoners awaiting trial or undergoing punishment. It is often of the utmost importance to a man in prison that he should be able to communicate with those who may be called as witnesses, or who are in danger of arrest in order to inform them of his own predicament or to suggest what they should or should not tell the police. It goes without saying that every letter written and received by a prisoner is carefully examined, and all missives of which the meaning is doubtful are passed on to the police. But professional malefactors are very wily. If the prisoner is not yet convicted, he may receive books and various other trifles. It is true, of course, that the books are cursorily inspected, but many a prisoner has obtained full information regarding vital matters in books that appeared quite normal, but in which just a tiny dot in pencil under certain words throughout the volume proved an excellent substitute for a letter. Or a man may express a wish to keep his mouth clean, and applies to the doctor for toothpaste. He generally obtains permission for this to be sent to him from outside, and many a time a neat cylinder of thin paper, protected by a slip of oiled silk, has thus been smuggled through hidden in the paste.

A case which came under my notice was still more ingenious. Messages were written in pencil under the postage stamps. When the prisoner received the opened envelope, which contained only a letter of cheer and encouragement from a loving but fictitious wife, he simply soaked it in his drinking-water until the stamps could be peeled off.

Again, another man received religious tracts, which carried secret information most cleverly disguised. The tracts had been printed by one of the gang to which he belonged, and words here and there were in slightly different type.

It is evident that the safest way to transmit intelligence secretly is to adopt a method which arouses no suspicion. It is far better to make certain that cyphers will

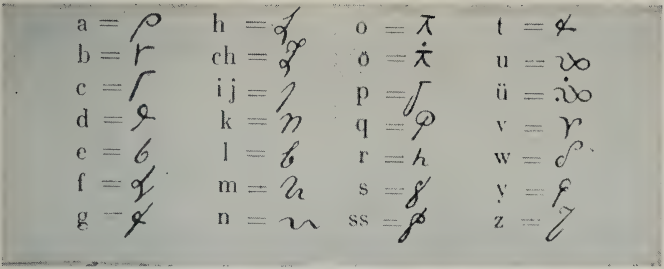
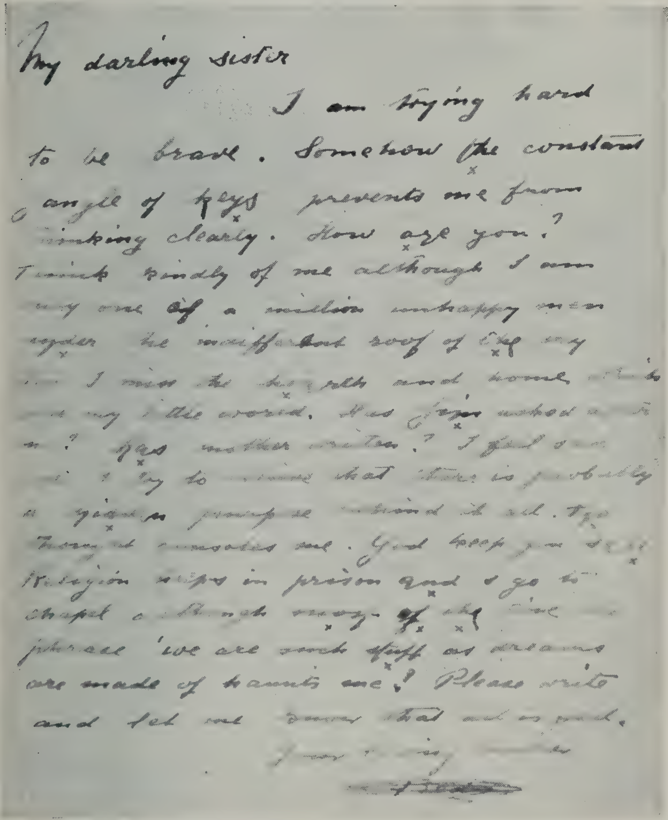

a =
b =
c =
d =
e =
f =
g =
h =
ch =
i j =
k =
l =
m =
n =
o =
ö =
p =
q =
r =
s =
ss =
t =
u =
ü =
v =
w =
y =
z =

Fig. I. Secret alphabet found on a German criminal



My darling sister

I am trying hard
to be brave. Somehow the constant
angle of keys prevents me from
thinking clearly. How are you?
Think kindly of me although I am
only one of a million unhappy men
under the indifferent roof of the sky
[illegible] I miss the [illegible] and [illegible] [illegible]
[illegible] my little world. Has [illegible] asked [illegible]
[illegible]? Has mother written? I find [illegible]
[illegible] try to imagine that there is probably
a [illegible] purpose behind it all. The
[illegible] amuses me. God keep you [illegible]
Religion helps in prison and I go to
chapel although many of the [illegible]
phrase 'we are such stuff as dreams
are made of haunts me! Please write
and let me know that all is [illegible].

Fig. II. An ingenious letter containing a hidden message

SECRET WRITINGS DEVISED BY CRIMINALS

not be considered as such than to attempt to render them scrutiny-proof in case they should be intercepted. The hidden meaning in the most cunningly constructed cryptogram, once it is suspected, inevitably will be disentangled. This lesson had been well learned by a man awaiting trial some years ago in an English prison. He succeeded in corresponding with his friends by a method so subtle that it baffled the authorities for a long time. His letters to a sister and her replies were the most harmless of missives, yet they contained vital information. Moreover, he had arranged beforehand to use three alternative devices, so that if his letters were compared they would not reveal similar characteristics. Fig. II is such a letter. The message is: 'The keys are under the hearth. Jim has hidden the safe and most of the stuff.' Each of these words, craftily woven into natural sentences, had one letter below the line. His second method was a tiny dot in the loops, and the third a difference in the slope of one letter. An exclamation mark indicated where the message ended.

Invisible inks are not often employed on letters from outside, because a prisoner does not have the means whereby the hidden writing may be revealed, but he often uses invisible ink for correspondence to be smuggled out or posted by the prison authorities. For this he possesses several substances. Saliva, water, and, in hospital, milk and lemon juice. He can also write with a pointed stick on a sheet of paper which has been steeped in water by placing a second dry sheet over it. When the paper dries, the impression is invisible. He then writes a harmless letter in the usual manner, taking care that the invisible text is not touched. His confederate, when he receives the epistle, effaces the ink with chlorine, and again soaks the paper in water.

Illuminated obliquely, the secret message stands out clearly. If water, saliva, or milk has been used, heat will bring up the invisible writing.

It is often necessary, when the police suspect that invisible ink has been employed, to be able to read the message, and even to photograph it, without leaving any trace of their intervention. Iodine vapour is utilized successfully for this in the laboratories. Iodine crystals are finely powdered in a mortar and strewn over a sheet of metal, which is then heated and the letter held in the purple vapour. The writing, whatever the substance employed, stands out clearly for about thirty minutes, when it fades again completely. Nigrosine and other colouring matters are excellent for revealing what has been written with saliva, but are not to be recommended when chemical inks have been used.

Iglycal is a dangerous composition, but very efficient, and will reveal any invisible ink known to science. The best formula is that suggested by Dr. Locard, of the Lyons police laboratories:

KL	4.
I	0.10
$NaCl$	5.
Al_2Cl_2	2.
Glycerine	3.5
H_2O distilled	30.

Great care must be taken when crushing the aluminum chloride, and only tiny fragments should be dissolved at a time. The reagent is applied with a piece of cotton wool. The letters stand out boldly in about five minutes and remain visible for some time. The advantage of the iglycal formula is that it leaves no stains.

A well-known and very efficient method for conveying commercial information secretly and safely is, of course, the use of code words previously agreed upon. Fortunately, criminals cannot group them so that the letter does not arouse suspicion.

Finally, there are the signals, tappings, and silent languages which every habitual criminal learns sooner or later, but to which as yet little attention has been paid in England. A prisoner under remand may receive visits daily. A detective or a warder always remains present; nevertheless, an adroit malefactor can carry on an apparently innocent conversation whilst giving precise but silent instructions to his visitor, and, moreover, he may receive valuable information in the same manner. There is the case of a man who, although a prisoner and closely watched, apparently knew every move made by the detectives investigating the crime of which he was suspected. By a process of elimination it became obvious that the information was conveyed by his wife, who came to see him every day. Yet their conversation was quite uninteresting. It was noticed, however, that the prisoner did most of the talking, whilst the wife sat idly drumming her fingers on the table. That gave us our clue. A microphone was attached and connected with a dictograph, whereupon the drumming was discovered to be an incredibly rapid series of signals in a private code.

We all know how the music-hall clairvoyant talks with his confederate. With his back to a blindfolded partner on the stage, he rapidly asks: 'Tell me what I am holding?' This form of question indicates for instance that it is a gold watch. 'What kind of watch?' means that it is a wrist-watch; by this system even such complex details as the number or inscription can be conveyed. There was a trickster of this kind who had actually invented what he called silent sounds. An almost inaudible jingle of coins, a sigh, a cough, or a single tap replaced the usual patter. The effect was impressive.

Many criminals have practised this kind of thing and brought it to such perfection that they are able to converse audibly in the presence of a police officer about such trivial matters as the weather, the prison food, or any unimportant subject, whilst in reality silently discussing the best means for checkmating the law.

Only lately at a trial in Paris it was noticed that a witness called by the prosecution started to relate what happened, but suddenly stopped, gazed fixedly at the dock, and then retracted what he had said, averred he had made a mistake, and gave evidence which coincided with the prisoner's defence. The man was, nevertheless, convicted, and confessed later that he could carry on a conversation with his friend by rapidly moving his fingers and eyes.

ANONYMOUS LETTERS

This chapter would not be complete without a few words about what has been termed anonymous graphomania — that is, the mania from which some people suffer of writing anonymous letters.

No one, I imagine, has anything but the profoundest contempt for anonymous letters, those poisoned arrows, sent hurtling through the dark, often at haphazard. They are cowardly, treacherous, vile things, and should be burned unread. Unfortunately, curiosity generally prevails — the recipient of such a missive is tempted to give just a glance — and the harm is done! Probably few people know that there is not a day passes when the police of every land do not receive dozens of anonymous letters; and, what is worse, they are compelled to read them and act upon the information they convey. It is the business of the police to pry and spy, and often the discovery of an unsuspected crime is due, not to the acumen of the detective, but to an anonymous denunciation. Yet — somehow — although a crime may thus be brought to their knowledge and the perpetrators arrested, even they who make good use of such unexpected information despise the slinking informer who dare not sign his name. The exhumation of the farmer Pace was probably due to numerous anonymous letters sent by malevolent busybodies. It is to the credit of the police that no action is ever taken unless a discreet inquiry has shown that such action is justified. To inform the officers of the law that a crime has been committed is the duty of every citizen, but he should remember that the police never divulge the name of an informer, and communicate with them frankly and openly. However, I do not intend to discuss anonymous denunciations, but those freakish outpourings of a diseased, obsessed brain which laboratory experts and pathologists have classified as anonymous graphomania.

That it *is* a mania and a form of hysteria there is no doubt. Such letters do not convey useful intelligence; they besmirch, insult, or threaten, as the fancy takes the writer. Nearly always the perpetrator is a woman or a young girl who has led a life of seclusion. Often such letters are even the work of a maid just arrived at the age of puberty. The mainspring in every instance is frankly sexual.

One might regard with pity the girl seized with this mania were it not that the harm anonymous letters may cause is incalculable. It is not an exaggeration to state that they have caused the death of more human beings than an invading army. As yet the offence is classified merely as defamation, whereas steps should be taken to intern the habitual writer of anonymous letters in a home for the mentally diseased. Sometimes, as in the Sheringham case some years ago, when an orgy of defamatory, obscene, and insulting letters startled the inhabitants of that beautiful town, the police take steps to punish the writer as a criminal. Although medical investigation has definitely proved it to be a disease, the offender is unfortunately sent to prison, whereas he should be interned in an asylum.

I can only deal with specific cases and the manner in which the laboratory experts trace the writer. The psychology of the anonymous maniac — to coin a new term — is very complex, and can be clearly discussed only in a medical journal; but brutally diagnosed it may be resumed under the general heading of sex perversion. One of the worst cases the Paris experts had to deal with happened not long ago. Four suicides, ten divorces, and a murder trailed in the wake of a tidal wave of anonymous letters which suddenly flooded the town. The disconcerting and quite exceptional characteristic of all the letters was that they did not reveal any signs of a disguised handwriting, although this is usually the first care of the anonymous writer. The letters all appeared to be the work of a young girl. The style of writing indicated a good education, the variation in the slope and the size of certain letters revealed the well-known symptoms of a nervous malady, but instead of being confined to a determined group of people, persons in every station, living widely apart and total strangers to each other, received a continuous stream of missives; nor were these merely offensive, they revealed an uncanny and apparently intimate knowledge of their lives and private affairs. Several were sent to the directors of well-known firms, warning them that certain employees were flagrantly dishonest, and in two instances this turned out to be true. Had the letters been restricted to one district, the task of the police would have been much simplified, but to seek for the writer in such a town as Paris was a formidable undertaking.

The paper and the ink were examined, their chemical composition determined, and detectives visited every shop selling such materials in the various districts where letters had been posted, but without result. As a last resort orders were given to the General Post-Office to examine all letters coming from certain neighbourhoods in turn, and photographs of the anonymous letters and their envelopes were given to all the sorters. It was a gigantic task and almost a forlorn hope. A week passed, and then suddenly the Sûreté were informed that an envelope addressed in the same handwriting had been found by an official. This had been posted in the Avenue Niel. Each of the three letter-boxes in the district was watched by a detective and a postman, and every letter posted by a girl or woman was at once taken out and examined. Two days later another similar envelope was discovered.

The girl — she was hardly more than a schoolgirl — who had dropped it into the letter-box was still in sight. She was followed to her home and questioned, and thus at last the whole amazing story came out. The girl's name was Yvonne Corbeil. She was the only daughter of a concierge, and, since her mother was an invalid, performed most of her duties. She had hit on a novel form of amusement. There was a directory in the lodge, for the convenience of the tenants. This she would open at haphazard, shut her eyes and prick a name with a pin. Then she would send a suitable letter, according to the standing of the unfortunate victim, informing him of the faithlessness of his wife, or, if a woman, of the imaginary escapades of her husband. When the name was that of a firm, she would write that a cashier or a traveller was dishonest and should be watched. This girl confessed to having sent hundreds of letters, signing them always 'A friend.' Curiously enough, one in fifty or thereabouts happened to strike home, with dire results. A medical examination confirmed the expert's diagnosis of acute hysteria and perversion.

A characteristic of this form of mania is that generally the writer of obscene and insulting letters also sends many to herself in the belief that thus no suspicion will fall on her. In fact to-day when the police investigate such an offence, they always try to discover who receives most of the letters, or who first complained to the local police. This usually proves to be the guilty person.

There was a case of this description not long ago, when a woman informed the Sûreté that she and her daughter constantly received offensive communications. Indeed, the missives were obscene beyond belief. Many other people in the town were plagued with similar letters. The handwriting was obviously disguised, but several letters written by the two women who had called at the Sûreté were obtained and photographed. The ink was found to be a special kind and similar to that used for the anonymous letters. The paper appeared to have been torn from a notebook. It was also discovered that the daughter had bought a notebook and a bottle of indelible ink at a local shop. Furthermore, the shape of several letters, notably the *o* and the *q*, was the same in the anonymous and the normal letters. The women were questioned, but indignantly denied having sent the infamous letters. During the interview a detective stood behind the mother and, according to instructions, several times pricked her arm with a needle. It was at once apparent that the woman was unaware of this and quite insensible to pain. Thereupon, while the magistrate continued his interrogation, the rooms of the mother and daughter were searched, and the notebook from which the leaves had been torn, the bottle of ink, and a blotting-pad with traces of the curious oblique writing were found. Confronted with this damning evidence, the mother confessed that she and her daughter were in the habit of composing these obscene letters, which they sent to all their acquaintances 'just for fun.'

One of the cleverest investigations was carried out by the Lyons Sûreté. A young man had recently become engaged to a very charming girl of good family. Everything went smoothly for a time, and the date of the wedding had already been fixed, when the fiancée informed him that she was constantly receiving very dreadful letters from some unknown correspondent informing her in no uncertain term of his amorous adventures and escapades, and that until it was proved that the allegations were untrue she could not marry him.

In despair the young man consulted the laboratory expert. When next he called, he was met with the unexpected question: 'Does your fiancée use the perfume known as Dandy?'

'Yes,' he replied, astounded. 'How do you know?'

'It is my business to know these things. I am sorry to have to inform you that it is probably the girl you intend to marry who wrote these letters to herself.'

At this the young man became very indignant, but was persuaded to bring several love-letters he had received from her to the Sûreté. To the expert's surprise, although they were redolent of the same perfume, traces of which he had perceived on the defamatory missives, the writing was smooth and flowing, with no single indication of a nervous disorder in the shape of the letters. Perplexed and uneasy at the thought that he had made a mistake, the expert called at the house of the young man. He was conducted to a small salon, and whilst waiting examined the room. On the mantel stood a squat vase, obviously handpainted, with the inscription: 'Souvenir affectueux de Clairette.' The shape of the painted letters was exactly similar to those traced by the anonymous enemy. When questioned, the man admitted that the vase was a present from his fiancée.

The girl was thereupon watched and caught posting another of the anonymous compositions to herself. She confessed that her parents had chosen the fiancé, but that the union was distasteful to her because she had made a pact with a girl friend whilst at school to remain single. It was this friend who had suggested the method by which she could evade the marriage without offending her parents. It was her friend also who had written the letters and painted the vase for her.

But the queerest case the laboratory at Lyons ever had to deal with happened a year ago. Anonymous letters written in strange, straggling characters, obliquely across the paper, were received by many women in the town. The message was always the same: 'A friend who wishes you well warns you that your husband is in love with his typist, who is plotting to bring about a divorce. Act upon this warning.'

Again in two instances the information thus conveyed turned out to be true. A microscopic examination of these letters led to nothing. There was no watermark on the paper nor anything that could serve as a clue. It was noticed, however, that the letter *t* was shaped thus, *p*. Such a flagrant deformation was a certain indication of insanity, and photographs of the anonymous communications were sent to all the doctors in Lyons. One of these, Dr. Pielbert, communicated with the Sûreté. He averred that several characteristic malformations resembled the writing of one of his patients, a typist who had been infatuated with her employer. She had shown signs of mental trouble since she had lost her post. Yet the girl affirmed that she would not dream of sending such letters, and the *juge d'instruction* was convinced that the girl spoke truthfully. The postmark on all the envelopes showed that they had been posted after midnight. Some days later a watching detective saw a figure slip furtively out of the house where the typist lived and walk to the letter-box. To his astonishment when he approached he perceived that it was a girl dressed only in a nightgown. The feet were bare and the long, silky hair was gathered in a net. As he reached out his hand to seize her, he perceived that, although the eyes were wide open, they stared fixedly into vacancy. The girl was a somnambulist. Obsessed by the idea that someone had warned her former employer's wife of her infatuation, she wrote these anonymous letters in a trance condition, and addressed them to all the people she had known whilst employed as typist. When awake she remembered nothing of what she had done.

CHAPTER VIII

FRAUDS AND CONFIDENCE TRICKS: JEWEL THIEVES — GAMBLING SWINDLES — CARD-SHARPERS — ART FRAUDS — INDIRECT THEFTS

In sharp contrast to the brutal and often uninteresting burglaries and robberies with violence are the clever and generally picturesque legion of frauds and confidence tricks. As old as mankind itself, yet every year they still find thousands of dupes. That is because the trickster is a psychologist. He has made a careful study of human weaknesses and is extraordinarily adaptable.

The burglar relies on his outfit and needs little more than physical strength and courage, whereas the successful swindler carries his business under his hat. In other words, he has to be clever and versatile. Above all he must be gifted with a vivid imagination. One often wonders how some of the more complex schemes came to be conceived. Fortunately the more bizarre a fraud is, the more certain becomes the capture of the criminal.

A clever trick was invented not long ago in Marseilles which cost a famous bank fifteen thousand francs; but the chief of the police laboratories was able to pounce on one tiny oversight which deprived the thieves of their freedom for several years. When a cheque is tendered on the Continent, the bank clerk hands the client a metal disc with a perforated series number. This number and the amount to be paid are marked on a voucher which the employee gives to the cashier, together with the cheque. The latter then calls out the number, the waiting client surrenders his disc, and receives his money.

One busy morning several people had been waiting their turn for some time. One of them finally became impatient and demanded why his cheque had not arrived.

'What is your number?' the cashier asked.

'Here is my disc — number 1. The cheque was for fifteen thousand francs.'

'Why, no, that cannot be. I paid that amount some time ago on voucher 9.'

An argument ensued, the police were called, and the bank slip with the words 'à payer 15,000 francs' sent to the Sûreté.

The laboratory expert at once perceived that the figure 9 had been altered. Originally it had been a 1. The ink was tested chemically and a spectrograph negative taken. This disclosed the fact that the same ink had been used in both cases, and that it was the special ink of the bank. But whereas the figure 1 had been allowed to dry, the alteration transforming it into a 9 had been blotted. At once all the blotters of the bank were impounded and numbered. Each one was photographed, enlarged, and examined microscopically. After hundreds of enlargements had been made, suspicious traces were found in a corner of one of them. This was then cleared of the superposed consecutive blottings by micro-photographs, until the 9 stood out clearly. A photograph taken by transparency was conclusive, for the added loop and tail were much fainter than the central part.

The employee to whom the pad belonged was followed secretly. His two accomplices were thus discovered, and all three were arrested and questioned. Their scheme was absurdly simple. It had been arranged that on a certain day when a well-known firm generally cashed large cheques, the clerk's friend should tender a cheque to him for a small amount. When the vouchers came from the manager's office, the employee had altered the 1, belonging to the cheque for fifteen thousand francs, into a 9, which was the number of his confederate's disc, and engaged the real tender of cheque number 1 in conversation. Thus when 9 was called, the man had paid no attention to it. The confederate had handed his metal disc to the cashier, who naturally paid him fifteen thousand francs. The photographs facing this page show the various phases of this interesting investigation. Had the dishonest employee not blotted the 9, he would probably never have been found out.

Another very curious fraud was invented by an Italian sentenced some time ago at the Old Bailey. He had hit on a method which placed him in a category by himself, for he was neither a counterfeiter, nor did his offence truly come under the heading of false pretenses. His trick was to visit London bank branches and throw a bundle of Czecho-Slovakian notes for a small sum on the counter, exclaiming merely, 'Change.' Among the genuine notes was an Austrian bank-note for a thousand Kronen, worth about tenpence. But over the word 'Budapest' he had printed 'Praag, Cunard Line,' with a rubber stamp. Extraordinary as it may seem, the cashiers of several banks paid him fifty-seven pounds for the note, under the impression that it was also Czecho-Slovakian. A bad memory was his undoing, for he returned one day to a branch where he had already operated. The cashier's memory was good, with the obvious result.

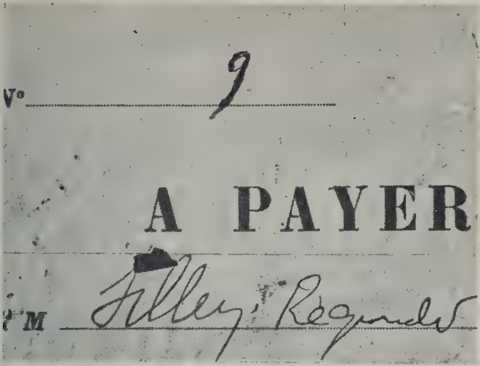


Fig. I. The altered figure

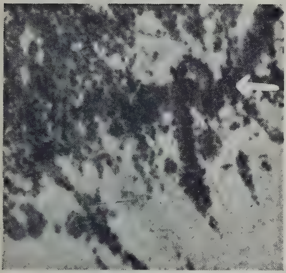


Fig. II. The 9 on the blotter enlarged

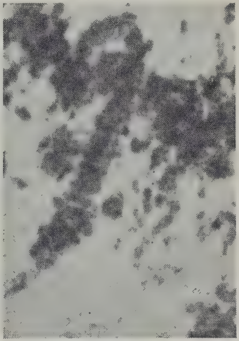


Fig. III. The 9 on the blotter further enlarged and reversed

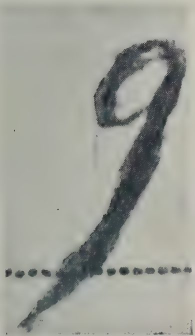


Fig. IV. The original 9 photographed under normal light and enlarged

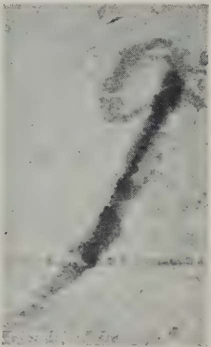


Fig. V. The same photographed under a special light, revealing the fraud

THE CASE OF THE ONE AND THE NINE

Frauds and Confidence Tricks

The fundamental principle underlying every classical example of confidence trick is the greed and very often the inherent dishonesty of the victim. This may appear to be a sweeping statement, but an analysis of the better-known methods will demonstrate the truth of it. There is, for instance, 'The Spanish Prisoner.' Everyone has heard of it, yet only last year the French police caught six gangs who had worked it successfully.

The details naturally vary in every case, but it starts like this: Several of the gang spend their time on the big steamers or in the best hotels, where they observe and study the various travellers. When one has been designated as 'soft,' arrangements are made so that he shall become interested in a handsome, charming girl who is apparently Spanish. An accident, a lost trinket, anything will do. Thereafter it is her business to create the required atmosphere. Over bubbling champagne, with soft music not too near, she tells him her sad story *because he has a kind face and will understand.* She is the daughter of a Spanish grandee, a fervent supporter of Don Carlos. Unfortunately, the Carlists were persecuted to such an extent that two or three years previously her father was forced to flee, and carried with him a huge fortune, which his enemies were seeking to confiscate. They were pursued and compelled to bury the treasure near an old ruined fort in the mountains. They had only just time to do that before the soldiers arrived and arrested her father, who had stayed behind to cover her flight. Since then he had languished in prison, but she had set her heart on buying his freedom. To do that she must find someone who will advance the money for a trip into the mountains in order to recover the treasure. As reward he shall receive half — generally at least ten thousand pounds. *She will, of course,* *travel with him*, for she can see that he is to be trusted. Meanwhile, there are several hundred pounds needed to be sent in advance to friends in Spain who will prepare for the transport of the money and generally help during the expedition.

Another gang wrote hundreds of very clever letters from Spain to people in England whose names they obtained from a directory or about whom their English agents had given them useful information. In this case the treasure was supposed to be in a strong-box or a bank-vault, where it had lain for years. Money was required to release it, and there was, furthermore, the *young and beautiful daughter* who was in great danger herself. A trusted friend was urgently needed to conduct her to England and safety. It seems a solicitor originated this clever scheme.

Then there is the stock-exchange swindle. This was lately worked with extraordinary success by an American gang. They lived in the best hotels, ran up tremendous bills, which were promptly paid, tipped handsomely, and finally pounced on some unsuspecting rich foreigner whose acquaintance they made through one of the hotel clerks. When they had established friendly relations, he was allowed to join in a gamble in shares in which he gained a small sum. A second and larger deal again turned out a success. These sums were, of course, paid out of the gang's working capital. This is called 'ground-baiting.' Then when his appetite was thus whetted and his confidence gained, a huge gamble was discussed in his hearing one evening, but he was informed that he would not be allowed to participate because the amount of money required was too great. Naturally this made him the more eager to join the combine, and after much pleading on his part the

Americans gave way with apparent reluctance. The essential condition of the deal was that the money must be instantly available, although it might be days before the *coup* could be brought off.

An appointment was, therefore, made for the following day, when each of the Americans placed ten thousand pounds in bank-notes in a leather bag. The victim did likewise, and the satchel was then sealed and carried to the hotel manager's safe, from which it could be withdrawn only if all were present. The next day the Americans were called out of town. Several days passed whilst the victim waited in vain for their return. At last he went to the police. The bag was taken from the safe and opened. Needless to say, instead of money it contained only bundles of newspapers. This trick is worked by means of duplicate bags.

Another excellent scheme is as follows: An old and venerable gentleman, envoy of a wealthy but eccentric philanthropist, is distributing large sums of money to deserving poor. But his health is failing and he would like to find someone to take the burden of this sublime mission from his shoulders. Naturally this story arouses the greed of the man he has picked as a victim and he eagerly volunteers to help. Several small sums are given him as a test. Then the venerable gentleman is suddenly obliged to leave, although thousands have still to be given away. He suggests that his newly found assistant can do this for him, but some proof of good faith is needed. He must bring (according to his means, which have been carefully ascertained) so many hundred pounds, to show that he is above keeping the money for himself. It is arranged that he shall come with the money the next evening, when they will dine together and discuss final details. When he arrives, a bag, apparently crammed with money (generally bundles of paper slips with one treasury note visible on top), is shown him and placed on a chair by his side. During the dinner he is asked if he had brought the money. Naturally he has; then, just as he has given it to his host, the latter is called to the telephone. He rises and, pointing to the bag, says laughingly: 'I'll leave this in your care. There are twenty thousand pounds there. I'll count your money in a moment.' He then walks away, holding it carelessly in his hand. When, after waiting an hour or so for the return of the venerable old gentleman, the victim opens the bag to make sure the twenty thousand pounds are still there, he realizes to his horror that it contains only about ten pounds.

A new swindle, also based on greed and doubtful honesty, was practised a few months ago in Soho. Some visitor to London saw a man just in front of him pick up something which glittered from the gutter. With a laugh the fellow turned and exclaimed: 'I guess you saw it when I did, so we'd better go halves. Look, this is worth something!' It was a sapphire and diamond ring!

Although quite against the law, in many instances this generous offer was at once accepted.

'Let's go to a jeweller and sell it,' was the trickster's next proposal, and off they went. Hardly had they walked a dozen steps, however, when he clutched his victim's arm. 'By Jove, that's lucky — there's So-and-So. He's a Hatton Garden diamond merchant — hey, Charlie!'

Charlie was then made acquainted with the find and shown the ring. After a careful examination in true professional manner, he would say carelessly, 'Not bad. I'll give you fifty quid for it,' and on the words pulled out a bulging wallet and extracted a fifty-pound note.

'That won't do,' was the confederate's comment. 'This gentleman and I are splitting fifty-fifty. You must give us smaller notes.'

Of course, Charlie had no change, and the finder of the ring would then hand the fifty-pound note to the victim, and say: 'Perhaps you've got twenty-five pounds for this? If so, that'll make us square.'

When later the partner in this dishonest transaction tried to change the fifty pounds at his hotel, he was politely informed that it was a counterfeit.

So much for confidence tricks. They are legion. Unfortunately, scientific investigation can do little in these cases except to classify and study the different methods, and only a close watch on hotels and likely places, by detectives who know the fraternity by sight, is an efficient method for combating them. I can but choose here and there among those cases which have come under my notice. Even to enumerate only the more notorious methods of crooks would fill several volumes. Jewellers are, of course, constantly exposed to their wiles. But there is one broad general principle underlying every swindle which should put the intended victim on his guard at once. This is the 'ground-baiting' by which confidence is established. The criminal intention manifests itself in easy-going generosity, exaggerated expenditure, or abnormal friendliness.

Lack of discernment in this respect nearly cost a famous firm of jewellers in the rue de la Paix a diamond necklace valued at a million francs. A wealthy officer had made the acquaintance of a polished and plausible nobleman, who had travelled on the boat with him and who, curiously enough, also occupied a suite in the same fashionable hotel where he usually resided. On several occasions this gentleman insisted on inviting the officer and his wife to sumptuous dinners and amusing entertainments. The Englishman had recently bought a beautiful necklace for his wife, which so fascinated their new friend that he requested the officer to come with him to the jeweller, for he intended to order one like it. After the many pleasant evenings they had spent together, he saw no reason to refuse such a slight service, and introduced his companion to the jeweller as 'a friend who wants a necklace like my wife's.' There was one in stock for thirty thousand francs, and the 'friend' paid the price cash down, in large bills. The officer had been chosen by the crook as sponsor because he was well known to the jeweller. He had now served his turn and was no longer needed. A week later the pseudo-nobleman returned and exchanged the necklace for another even more expensive, again paying cash. In the course of a month he also bought several rings, and a cigarette-case, thus gradually establishing the necessary confidence. Then one evening he called and selected a necklace priced at one million francs, which was to be sent to the hotel the next morning for his fiancée's approval.

The jeweller went there accompanied by an assistant. The necklace was quite to the supposed fiancée's taste, and was paid for there and then with a cheque. For a moment the merchant hesitated; then he remembered that this new client had been presented by the English officer; furthermore, necklaces at such a price were not sold every day. The cheque was accepted, and he withdrew well satisfied. It was Saturday, and past noon, and the bank was closed. Needless to add, when, on Monday morning, the cheque was tendered at the bank, it was found to be worthless. Fortunately, as the jeweller reached the street, dazed and horrified at his loss, a detective touched his arm, and said: 'Your necklace and the thief are at the Sûreté. Please come with me to identify them.'

It turned out that the fellow had overrated his own cleverness. He forgot when he followed the Englishman to Paris that he in turn might be followed. Scotland Yard had immediately warned the French authorities, and his every action had been reported. Thus, when he stepped out of a cab at the Gare du Nord, leaving his luggage in lieu of payment at the hotel, two detectives had seized the astonished trickster and conducted him to less roomy lodgings at the *dépôt*.

JEWEL THIEVES

The tricks of the specialist in swindles that are directed chiefly against jewellers are countless, but it may not be without interest to expose a few of them. It is a true saying that if there were no receivers there would be no thieves! This is obvious. To commit a theft or a burglary may be both difficult and dangerous, but in reality the difficulties and dangers, when converting plunder into money, are much greater. Therefore, next to hard cash, jewellery attracts the intelligent criminal as the most desirable loot. It is not bulky, of great intrinsic value, and more willingly bought by the 'fences' than anything else. The thief knows well that it is generally when he tries to sell stolen property that he is traced, especially if he attempts to deal with honest merchants. That he goes to these at all is due to the fact that receivers are more dishonest even than the men whose activities bring them such large profits. Usually they pay but a tenth of the value, even for jewels, and often, if their 'client' is a novice, or without friends, they pocket what he offers, and give him nothing in return, sarcastically daring him to go to the police.

Nevertheless, although criminals hate them, receivers thrive, and their numbers are legion. The police of every land have detectives engaged upon nothing else than a constant search for these emulators of Fagin.

It is because jewels are so easily hidden, and because the glittering displays of Bond Street and the rue de la Paix are a constant temptation, almost a challenge, to enterprising thieves, that jewellers are victimized more often perhaps than anyone else.

It may be of interest, and I hope useful, to expose some of the countless tricks and complex methods evolved by jewel thieves. Somehow, although they are gradually becoming more wary, jewellers are again and again the dupes of almost classical systems, for, curiously enough, the criminal mind appears to move in a rut. Both international gangs and solitary criminals always prefer the tricks which have proved successful on former occasions. Thus, again, by classifying such methods and identifying these with the men who employ them, the police are able to determine with certainty by whom a theft has been committed.

Jewel thieves are the élite of the underworld of crime, but even among these aristocrats of the light-fingered tribe there are gradations. There are those who operate only on a large scale, possess the means to dress well, frequent the best hotels, own a car, and have a working capital. Such men are naturally more dangerous than those who live, as the saying is, aptly enough, 'from hand to mouth,' for many of them when operating actually hide single diamonds or pearls in their mouths.

A fashionably dressed man will enter a shop and ask to be shown some unset stones. Generally he exhibits an earring or a pendant, and explains that he wishes to buy a stone to replace one that has been lost. After examining and choosing among the jeweller's wares for some time, he takes advantage of a moment when the salesman's vigilance has relaxed, and palms a diamond, at the same time picking up another, which he carries to the window or to a lamp, in order to test its fire. He breathes on it — as experts do — and at that moment flips it into his mouth, substituting the stone which he palmed. This he returns ostentatiously to the counter. He may then make a small purchase, or declare himself dissatisfied, in order to leave before the theft is noticed.

Another method is known as the glove trick. The thief, dressed in a motoring-coat, and wearing large gloves, stops his car — generally lent him for the occasion by one of the many receivers — outside the shop. He enters hurriedly, and requests the jeweller to show him some rings. Whilst examining them, he constantly expresses the fear that he will get into trouble for leaving his car unattended. Nevertheless, he is hard to please, and soon quite a number of fine rings accumulate on the counter. Whilst the assistant is expounding their merits, he takes off one of his gloves, generally from the left hand, and, pointing to another trinket, lays the bare hand for a second flat on the rings. In the centre of his palm is a dab of pitch. A slight pressure is sufficient to cause a ring to adhere to this. He immediately draws on his glove again, and contrives to make a speedy exit. Practice makes perfect, and these men practise daily for hours in order to increase their proficiency.

Another trick, often used in France and Germany, necessitates the presence of a confederate. While a distinguished and apparently rich client is making a selection, a beggar enters and asks in a pitiful whine for alms. The jeweller, of course, orders him out of the place, but the customer, with a good-natured laugh, pulls some loose silver from his pocket, passes it from one hand to the other, as though counting it, and drops the money carelessly into the fellow's hand. But during those few seconds several jewels have been cleverly affixed to the coins by pitch or putty. The beggar hurriedly decamps, and the generous client makes his purchase and leaves also. It has happened several times that the jeweller noticed his loss before the thief was able to get away, and at once accused him of the theft. The latter thereupon became very indignant, and demanded to be searched. Naturally nothing was found on him.

Or the distinguished nobleman — he is usually a count — may first establish confidence by purchasing a number of trifles, taking care to pay cash, and to have the goods sent to a first-class hotel, in order to impress the jeweller with his high-sounding name. Then one day he calls with a friend, or with a woman purporting to be his wife. Whilst examining some really valuable trinkets, the friend — or the wife — suddenly turns pale, staggers to a seat, and slips to the ground in convulsions. The foam which issues from her lips and her pallor — both produced by chewing and swallowing soap — are wonderfully impressive. Naturally much confusion ensues. The confederate is brought round and helped to a waiting car, and the chauffeur ordered to drive to the hotel to which former purchases had been sent. Only when they have gone is it noticed that a valuable necklace or numerous rings have disappeared.

The police are at once sent to the hotel, to which the couple do *not* return. To attempt to trace the thieves would be a waste of time. Instead, detectives, who know the haunts and receivers of every specialist, spread their nets there, and usually capture the ingenious couple when they have shed their fine feathers and are lying low in some obscure lodging, or when they attempt to pass the stolen goods. It would help the police greatly if, immediately after a robbery, the jeweller were to close his shop, touch nothing, and telephone to headquarters, since the thieves will inevitably have left many clear finger-prints on the counter and on the polished surface of glass-cases.

Every receiver who trades in 'sparklers' is an adept at melting the settings and altering the shape and cut of stones, which are then passed on to 'travellers' to sell abroad. Thus, as I have stated, to discover and classify all the receivers is more important by far than the immediate capture of the thieves. Many of these receivers furnish the clothes, car, and indispensable working capital of the operators, and are the hidden instigators of many jewel robberies. The law should, therefore, punish them much more severely than it does.

Formerly a method much employed in England and America was to have a selection of jewels sent to an hotel or apartment. One must remember that necklaces or other trinkets of great value are not sold every day, and the dealer is naturally eager to accede to a prospective buyer's wishes in every way. Furthermore, thieves who specialize in establishing confidence are incredibly clever, and have learned to play their parts to perfection. Their plausibility is astonishing.

Although the press has given wide publicity to the more notorious robberies of this type, thus making dealers more careful, there was a case only lately which illustrates the extraordinary cunning of jewel thieves. A diamond necklace was taken to an expensive suite at a famous hotel in Paris for the approval of a lady who was ill in bed. When the assistant called, the husband was shaving. He asked the man to be seated, took the case, opened it, examined the necklace, closed the case again, and placed it on the dressing-table against the wall, in full view of the jeweller. He then finished his toilet quickly, and, without approaching the case, inquired of the unsuspicious man if he had brought the receipted bill. Whilst reading it, he stood for a moment between the jeweller and the dressing-table. Then he folded the bill and handed it back, suggesting that, since he intended to pay cash, there should be a slight discount. To this the jeweller agreed. Thereupon he informed the man that he would see if his wife could receive him, in order to examine the necklace in his presence, adding with a charming smile that he quite realized his visitor would not wish him to leave the room with such valuable gems. He then entered the adjoining room, and the jeweller caught a momentary glimpse of a lady in bed. The door was closed, and there came to his ears a murmur of voices.

Finally there was silence. The unfortunate man sat for a long time, his eyes glued on the jewel-case lying on the dressing-table, but at last, becoming impatient, he rose and picked it up. It was empty! Frantically now he flung wide the door and rushed into the bedroom. The lady in bed was still there. It was a wax head with the clothes cleverly arranged around it. A metallic snap caused him to turn in haste. Both doors were now locked and the bell wires had been cut. By the time one of the hotel servants came in answer to his incessant knocking, the thieves were far away. A cunningly concealed opening had been made in the wall just behind the spot where the box had been placed, and during the few seconds that the bogus customer had stood before the assistant reading the bill, a confederate had abstracted the necklace. The locked doors were a last piece of incredible audacity.

Fortunately, no time was lost in calling in the scientific experts. Three perfect finger-prints were found on the stick of shaving-soap, and two more on the plate-glass covering the dressing-table. The assistant recognized the photograph on the police chart shown him as that of the man who had been shaving. It was Jean Manesco, a well-known confidence trickster. The Sûreté was convinced that there was only one receiver who would dare to buy stones the size of those composing the necklace, which was valued at twenty thousand pounds. Furthermore, Manesco was known to have dealt with this 'fence' on former occasions. He was at once shadowed, and detectives watched every road and railway station. Two days later the receiver was arrested just as he alighted from a stationary taxi with the loose diamonds in his pocket. In the car was one of the thieves.

A method which in the last few years has cost jewellers large sums is extremely clever. It was invented by an organized gang, of which several members were former goldsmiths. A sketch would be made of a piece of jewellery in a shop window, and a perfect replica manufactured in similar gold or platinum, but with paste instead of real gems. A fashionably dressed man or woman would thereupon visit the jeweller, and request the chosen loot to be brought to an apartment on approval, where the faked trinket would be, of course, substituted for the real one. The bogus customer would then tell the employee that, on second thoughts, he or she had decided to call later and select something else. Sometimes the substitution would be actually carried out in the shop, and in two instances the fraud was not discovered until several days later.

In some cases a piece of jewellery, which would be always composed of two or three diamonds of great value, was bought by one of the band, and only one single stone removed and replaced by one of little value, but of the same size, or by an excellent imitation in French paste. The customer then returned and explained that he had intended it as a gift for a lady, but that she did not like it. Therefore, he wished to exchange it for something else. Of course, the jewellery thus bought for cash was sold again with only a small loss, which was largely compensated by the dishonest acquisition of a fine diamond.

The Lyons laboratories have discovered that a photograph taken by means of ultra-violet rays will immediately show if a stone has been tampered with, reset, or replaced by another.

Yet it is not always the dealer who is victimized by jewel thieves. One of the most audacious tricks, which had been obviously prepared in advance was perpetrated in Paris. A lady who is famous for her jewellery, upon hearing that a foreign potentate was to be present at a gala night at the Opéra, decided naturally enough to adorn herself for the occasion with her most beautiful jewels. She invited two friends to share her private box. These two friends telephoned at the last moment, and informed her that they could not accept the invitation. It was afterwards discovered that the friends had been put off by telegram, and it was one of the thieves who telephoned in their names. The lady's box was opposite that occupied by the royal visitor and his suite. During an interval an officer in a gorgeous uniform, and apparently an equerry of the king, presented himself with many compliments and excuses at daring to disturb her. He explained that his royal master had been so struck by the beauty of her earrings that he would consider it a great favour if she would allow him to examine one for a moment, since it was his desire to obtain similar jewels for the queen. Flattered and awestruck at this unexpected honour, the lady at once handed one of the *solitaires* to the officer. Although she waited patiently until the next interval, the latter did not return, nor could she see him in the royal box.

She was about to send an attendant to make inquiries when a knock came on the door of her box, and an usher introduced a tall, dark man as a *commissaire* of police.

The visitor gave her a glimpse of his tricoloured badge, and at once said: 'Madame, did you not give one of your earrings to an officer who pretended to be in the king's suite? Yes, I thought so. Well, you have been victimized by a very clever scoundrel, but we have caught him. Give me the other earring so that we can identify the one he had in his possession, and then, after the performance, follow the detective, who shall wait outside the door of your box, to the police station in the rear of the building. Thus you will avoid all scandal.'

Without hesitation the lady gave the *commissaire* the duplicate of the jewel stolen by the officer. Needless to say, when she went to the police station, neither officer nor *commissaire* was there. Both were members of an international gang. They were caught a week later in Antwerp. This time the capture was due to information telegraphed by a diamond merchant to whom the stones had been offered for sale.

Everyone no doubt still remembers the theft of the famous pink Condé diamond from the museum at Chantilly. This case does not really belong to the category known as jewel thefts. It was a clever burglary, committed by two Alsatians. They were traced because they offered the small stones which had surrounded the pink diamond to a woman who deals in precious stones. The thieves learned in time that the police had been informed of the transaction, and decamped, leaving their luggage in the hotel where they had been staying. The proprietress, anxious for her money, since her tenants did not return, opened their bags, and among the linen and clothes found a large rosy apple. Apples have always tempted Eve. She cut this one in half, and, under the peel, which was bruised on one side, discovered the priceless pink jewel. It was reset, and once more adorns the museum. The two thieves were caught several months later and sentenced.

GAMBLING SWINDLES AND CARD-SHARPERS

Perhaps one of the most difficult problems the scientific police have been compelled to tackle is how to deal efficiently with the legion of crooks who batten on the human passion for gambling. The card-sharper, who in Latin countries is termed a 'Grec,' has been placed in a category midway between confidence tricksters and counterfeiters. Dishonest gamblers of all types belong to what is technically known as 'indirect thieves.' They range from the swindling race-course tipster and pea-and-thimble rigger to the impeccably dressed, soft-spoken, apparently well-bred gambler who frequents the clandestine or authorized casinos and clubs. Unfortunately the Grec, when unmasked, is rarely, if ever, prosecuted. Clubs or casinos content themselves with kicking him out, and thus, since he is an adept at disguise and his aliases are not to be counted, he continues his dangerous activities elsewhere unhampered by police intervention. Moreover, since gambling itself is technically an offence, there is in many lands no law which can punish him, except indirectly. Formerly, in the Western communities of America, the dishonest gambler was shot or hanged. But to-day, in Europe, and even in the States, he risks nothing worse than a thrashing or a gentle hint that he would do wisely to cross the frontier. Therefore he thrives in every country. The love of gambling is as old as humanity, and will last as long, whether it be racing, cards, roulette, or stock exchange; and wherever men and women forgather to woo the fickle goddess Chance, there the Grec will be found. However, the police experts are practised psychologists, and have made a profound study of all the known tricks and their variants, because they know that these will in time react on the manners and appearance of the sharper, making it possible to recognize him by certain indelible signs.

The professional cheat is found in every walk of life, but the aristocrat of the profession, the Grec, is in a class by himself. The name is believed to have been coined in the reign of Louis the Fifteenth, because a Greek named Apoulos became notorious for his skill in cheating. The dishonest gambler must be born with certain aptitudes if he is to achieve success. Since he lives by his wits, these have to be keen, adaptable, and ever alert. His eyes must be exceptionally good, and his hands soft, flexible, and perfectly under control. First and foremost the gambler is a trained student of human nature. Physiognomist and psychologist from necessity; experience, observation, and practice soon develop in him an uncanny skill in picking and handling a victim. I have known Grecs whose senses were so acute that they actually felt the change in the atmosphere, as a suspicion that all was not well slowly crystallized in their partner's brains, long before these were themselves aware of it. The faculty resembles a psychic sense, or is, perhaps, telepathy. There is no doubt that the successful sharper is a thought-reader, although he may be unconscious of the gift. When the warning vibrations sound the silent alarm, he is quick to change his tactics. He plays fairly or loses purposely, until the balance is again established, and his mental barometer swings to 'set fair.'

It has often been said that a crooked gambler can be detected by an indefinable something in his manners — a certain coarseness, increased by too much jewellery, exaggerated elegance, or the use of strong perfumes. There may be exceptions, indeed, but the really clever Grec makes no such blunders. If he is sitting in at a game of poker with middle-class merchants and business men, he will adapt his ways, speech, and dress perfectly to fit his surroundings. He may err on the side of generosity in drinks; but that is a fault easily forgiven. He never wears more than one or two rings, for his hands must not be hampered by anything that may glitter and thus betray their movements, which are too swift for the normal eye to follow when he extracts prepared cards from hidden pockets. In the select and expensive clubs or Riviera casinos, his attire is carefully chosen, his speech soft and cultured, and his bearing proud and reserved. Therefore it is difficult to detect this type of criminal — for whatever the euphemisms he has made popular, he is a criminal; prepared, when nothing else will serve, to waylay, rob, and even kill — elegantly.

The experts who have studied the Grec have noted two things. First his hands, those sensitive antennæ, which he constantly massages with cold cream, and always protects from the air by soft leather gloves when not working, are quite distinctive. So acutely sensitive do they become in time that a clever sharper can detect merely by the feel the infinitesimal difference in the surface of the cards he is handling, and knows whether they are picture cards, aces, or ordinary cards — an incredible feat, when one remembers that his fingers can glide across them only for the fraction of a second. I once met a notorious crook who could thus infallibly detect the large printed patch of the ace of spades.

Then there are his eyes. A trained professional gambler undoubtedly has a wider visual range than a normal man, and the mobility of his eyeballs is extraordinary. Restless, watchful, piercing, they flicker ceaselessly from player to player, noting every movement and change in expression. Many detectives have stated that this movement becomes at last a fixed habit — a stigma — by which the professional sharper can be recognized. He, too, has realized this, and if his eyebrows are not bushy by nature, he so renders them by constant cutting, and even shaving. These eyebrows, when drawn together in a frown, mask the uncanny motions of the eyes. Sometimes he will wear a *pince-nez* with plain glasses, for not only does the reflection in the glass serve a useful purpose, but at an opportune moment they are made to drop in order to create a second's diversion. Unlike the conjuror, the Grec cannot fire a pistol or point across the stage at the crucial moment when his nimble fingers are busy. Therefore he has evolved other methods which serve him equally well.

One of them, I have said, is to drop his glasses with a clatter at the moment he exchanges with lightning speed the normal cards for those he has prepared. Another trick which was used in a private *cercle* at Monte Carlo required the assistance of an accomplice. One of the members, a lady, at a given but imperceptible signal, upset a pile of coins or counters. Whilst the players helped her to retrieve them from the floor and table, the Grec slipped his prepared cards among the others. Another trick, which was tried, but failed, at the roulette tables, was very ingenious. The dishonest players chose a table in full swing, where large sums were staked all over the board. At the instant that the ball rolled into the winning number, a lady rose with a shriek and fell forward in seeming convulsions in such a way that an outflung arm partly covered the winning numbers on the green baize. Naturally several people, amongst them the confederate, sprang forward to succour the apparently unconscious woman, who was at once carried away by attendants. During the moment her arm had masked the number, the crook, when lifting her, had placed several bank-notes to win. But it was too spectacular a trick to be repeated with impunity, and, although the bank paid the first time rather than risk a quarrel, the clever trickster was immediately required to leave the Principality.

The usual battle-grounds of the sharper are the rooms where card games are played. He has many methods for marking the cards in such a way that to all but himself these marks are invisible. One of them is to prick the important cards in one corner with a hot needle steeped in wax. The wax melts and fills the minute orifice, but the sensitive fingers of the Grec easily detect it. Another way is to roughen the edges very slightly at one spot. Or the backs are rubbed with finely powdered pumice stone. Most cards are highly polished, and if a tiny mark be made at the edge with a pointed stick steeped in water and allowed to dry, the polish is reduced at that spot, although the mark is invisible. Only the practised sharper can discover the change by the feel of the card, because he knows exactly where it should be. Superhuman swiftness, extraordinary adaptability, nerves of steel, fingers as sensitive as the tongue, and the eyes of a lynx — those are the qualities necessary to make a successful Grec.

This type of criminal is nearly always an international, speaking many tongues fluently, with a profound knowledge of the great European cities. By devious means he obtains admission to those places where gambling on a large scale is practised. He does not always work alone. He has attractive women as helpers, and employs men who lack his superlative powers, but who have been trained instantly to coöperate in an emergency, or to encourage the victims to play and to increase their stakes. The Grec has easily accessible but invisible and cunningly contrived pockets, in which he carries spare packs, prepared cards or complete sets arranged for special games. But he does not depend on these helps alone. He is skilled to take instant advantage of natural factors which may render him material assistance. Mirrors, for instance, are invaluable to his keen sight. He plays warily until it is his turn to shuffle and deal. If he has been unable to substitute his own cards for those being used, he frequently places a polished silver or gold cigarette-case beside him. The flicker of the passing cards are reflected in this, and a trained memory makes it possible for the Grec to visualize in his brain every player's hand.

Needless to say he is a master at sleight-of-hand. We have all seen the music-hall conjuror palm, slip between his fingers, and keep hidden five or six cards. Such tricks are child's play to the Grec. One of his usual methods, when he wishes to retain a certain card or series of cards, is to grip them one by one with specially developed muscles on thumb, palm, and finger-ridges. Whilst apparently dealing normally, although with lightning speed, he is in reality passing on those cards which fit in with his system of play. If he needs cards from his secret pockets, he drops his *pince-nez*, overturns a glass of wine, or gives the signal to a confederate, who creates a diversion. It is the age-old system of the conjuror applied to cheating. Then there are the various methods for compelling a player to cut at a certain spot, a flip of those supple white fingers, a card is bent to form a bridge — concave or convex — and nine times out of ten, since the pack separates more easily there, the victim cuts at the desired spot. All this probably seems laboured and crude, because it is impossible to convey an adequate image of the incredible adroitness, the magnetic plausibility, and the perfect control of the game which the cheat has acquired from long practice. It is this mastery of every motion, however, which betrays him to the watching detective.

A very clever police officer, head of the department at the Paris Sûreté which deals only with the detection of card-sharpers, realized when he accepted the task of cleansing the clubs and casinos, that this could best be done by meeting them on their own ground. Schooled by a Grec who had become an informer, he practised diligently until he, too, had mastered most of the tricks of the trade. It was not a difficult matter when he discovered that one of the fraternity was busy among the players to single him out, and to determine the system being used. Thereupon he simply turned the tables on the cheat, either by nullifying all his moves or by cleverly displacing the cards, so that he became the winner. Generally, after a short time, the dishonest gambler would retire from the game, and contrive to signal to the detective to do likewise. Convinced that he was dealing with a stupid or treacherous colleague, he would then draw him apart and reproach him with queering his game, or offer to go into partnership for the evening. The officer always proposed a quiet walk to talk things over; a walk which ended — for the cheat — at the nearest police station, where his guilt became undeniable as pack after pack was fished from hidden slits and pockets. Afterwards, the money the detective had won by his own cheating was sent back to the club or casino and returned to the astonished gamesters.

Lower down on the ladder of successful cheating are the railway card-sharpers. Although many of these were once assiduous frequenters of the casinos, a series of bad exposures generally caused them finally to be marked down until they could no longer hope to pass unnoticed, even though disguised. The big liners were formerly a fruitful source of income to professional gamblers, but now every big ship has one or more detectives on board for the protection of its passengers; and the work has become too dangerous. Visitors to Continental cities would do well to beware of the self-styled guides, such as those who pester all foreigners passing near the Opéra and the Grand Hotel in Paris. Most of them are touts for clandestine gambling-dens, where the unwary stranger will win for a time, but that time is woefully short. He is generally allowed to retain only his life and his clothes.

THE POLICE EXPERTS AND ART FRAUDS

Art frauds belong to a category in criminal records which has not received the wide publicity that the more crude burglaries, forgeries, and confidence tricks have obtained, although they generally aim high, demand great natural aptitude and specialized knowledge, and, when successful, defraud the victims of considerable sums. The reasons for this conspiracy of silence are easily understood. Until lately only a few highly paid connoisseurs were able in exceptional cases to determine whether a fraud had been committed, and such experts, since they relied only on the carefully acquired experience of the senses, were often led astray by their personal tastes and dogmatic conceptions, and their reports were usually inconclusive. Furthermore, the dupe in most cases preferred not to advertise his own incompetence by a public prosecution. But the number of frauds committed every year by means of faked paintings, clever copies of statuary, or adroit imitations of ancient manuscripts, and even the manufacture of prehistoric discoveries of bones, weapons, and inscribed tablets, have become so numerous that the police laboratories, and more especially those at the Paris Sûreté, have finally been entrusted with the task of evolving scientific methods whereby it can be infallibly determined whether a work of art, a prehistoric excavation, or an object purporting to be a relic from a past civilization is authentic, without relying in the least upon the specialized knowledge of the savant. This step might have been taken long ago, for it is obvious that the methods utilized for detecting forged wills or bank drafts can be applied equally to ancient or modern manuscripts; and the work of the painter and sculptor has as many personal qualities and idiosyncrasies as that of the burglar when he handles file, jemmy, or blowpipe. The microscope and chemical analysis can immediately ascertain the age and composition of doubtful Phœnician trinkets or prehistoric pottery.

Everyone has probably heard of the notorious Glozel controversy, so that I need but recall the main facts. A family of peasants in a hamlet not far from Vichy abruptly announced that they had discovered flint and bone weapons, pottery, funeral urns, and, above all, a number of stone tablets which bore, chiselled in their polished surface, inscriptions in an unknown language. The importance of this discovery — if authentic — was that it proved man of the Stone Age to have been already skilled in the use of the written word. The owner of the land where these treasures had been unearthed installed them in a barn and charged admission to his improvised museum. Archæologists and savants came from all parts of the world to inspect these tablets. Naturally many were sceptical, and pronounced them to be frauds; others declared them to be genuine. Books and pamphlets were printed by the dozen, and the newspapers in every land gave first one and then another version as the expert commissions made their reports. Finally, since the money earned by the museum brought the whole matter within the province of fraud if the exhibits were faked, the police suddenly and unexpectedly raided the place, and seized a number of objects. It is also alleged that the unknown but contemporary carver of the tablets knew so well that file-marks would be detected by the microscope that he had cleverly manufactured tools of flint and toughened glass, and that some of these were found by the police.

A number of tablets have been sent to Dr. Locard, who is eminently fitted to investigate the matter, and only his report will prove definitely whether they are authentic or not. Until then the matter must remain *sub judice*.

A similar case was that of La Glaizière.[1] This was proved beyond doubt to have been a clever fraud, because finger-prints were found impressed in baked clay pottery which could only have been left recently, for their type was quite modern. It is perhaps not generally known that the lines and spirals which I have described in my chapter on finger-prints have developed and become more complex since the days of primitive and simian mankind. The finger-tips of the anthropoid ape have no loops or spirals, but merely a series of slightly curved perpendicular lines. In prehistoric man these lines had become simple loops; it is only the more civilized races who have the complicated designs now familiar to everyone.

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[1] See *The Invisible Web.*

Although many vestiges of prehistoric finger-prints have been examined, none of them have ever differed from the simplex curve type. Thus the presence of complex finger-prints on objects supposed to be prehistoric proves them to be frauds. There are also a number of chemical tests, and micrographic and spectrographic methods, which can determine conclusively the age of an object. Furthermore, its fluorescence, when exposed to ultra-violet rays, is so characteristic in every case that a mistake is impossible — a fake is at once revealed, no matter what artificial ageing process has been used.

A very famous piece of statuary was bought not long ago by a clever trickster and the sale widely advertised. This fellow was extraordinarily gifted. He set to work and produced a series of perfect copies from the original, complete in every detail, and with the artist's signature. He then sold each copy privately in various countries as the authentic work of the artist. Finally he also sold the original for a sum equal to that which he had paid for it.

It was quite by chance that one of his dupes happened to see a duplicate of his own statue in a shop. He naturally inquired whence it had come, and was informed that it had been sold under the hammer at the death of the owner. The shopkeeper averred that it was the original, but, after a heated argument, consented to go to the man's house to examine his statue. The visit was unsatisfactory, and even the merchant, who was an expert, was unable to determine which of the two was a copy.

The police were then informed, and their investigation brought to light six more 'originals.' The man from whom they had been bought was, of course, arrested. Micro-photographs under mercury-vapour illumination were made of the signatures, and of a spot specially chosen on each statue. Thus at last the original was discovered by the minute but characteristic chisel lines, which were compared with those on other authentic productions by the same artist. These lines, invisible to the eye, and even under the microscope in ordinary light, were absent on the copies. It was the only conclusive proof obtained, for the signatures were perfectly imitated.

The photographs facing page 234 show another statue which has been copied for the purpose of demonstration. The difference in the texture of the leg is very apparent. It has been suggested that in future artists should apply at the police laboratories for a chart of identity, on which would be affixed an enlarged photograph of their characteristic manner of working. A similar chart would be classified under their name with a duplicate photograph. It would thus be a simple matter for anyone to ascertain whether he had truly bought the original by applying for a test photograph, to be compared with that on the chart. No mistake could then occur, since it has been definitely proved that to imitate the microscopic lines and scratches on the surface would be more difficult by far than the most complex forgery.

A case occurred recently which, but for the laboratory expert, would have cost a great British firm of underwriters a huge sum of money. A painting, purporting to be by a famous Italian artist of the primitive school, was insured for a very large amount. Art experts nominated by the insurance company examined the painting, and their reports stated that it was, indeed, by the great Italian artist, and a perfect specimen of his work. Thereupon the company signed the agreement.

A few months later a fire broke out on the premises where the picture was supposed to be. The owner, who was absent at the time, at once sent in his claim. The assessors discovered fragments of the frame and shreds of the painting among the débris, and fortunately a tiny uninjured piece, not more than half an inch square, which had been protected from the flames by an edge of the heavy frame. This was submitted to the laboratory experts. Although it was a delicate and expensive procedure, a picture by the same artist was found, and the owner was finally persuaded to allow the police to make comparative tests. Greatly enlarged photographs were taken of the painted surface and the canvas, and obliquely illuminated micrographs of the brush strokes were also made. The spectrograph came into play in order to analyse the composition and age of the paint and canvas, and certain chemical tests were made by means of microscopic particles taken from a spot on the painting which was the same colour as the fragment found by the assessor.

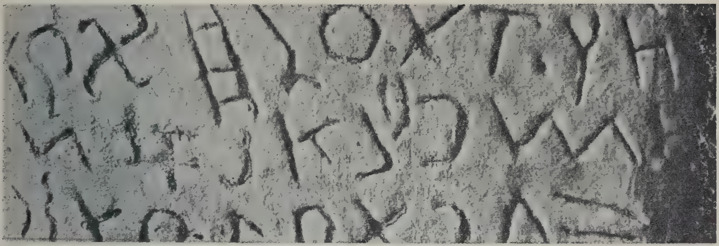


Fig. I. A portion of a tablet found at Glozel and tested at the Lyons laboratories

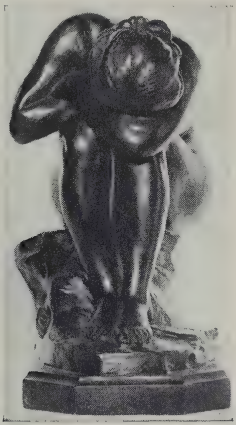


Fig. II. The statue from which the detail Fig. III was made

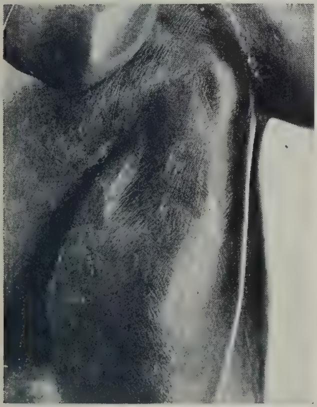


Fig. III. The authentic leg showing the minute chisel marks

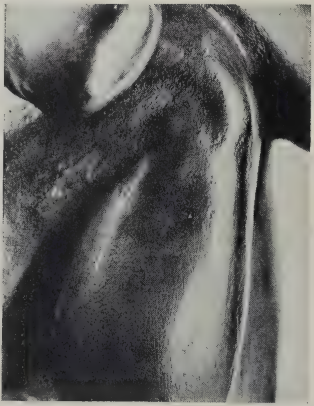


Fig. IV. The leg of the copy, on which no chisel marks show

ART FRAUDS

These various experiments proved that it was not the insured painting which had been destroyed, and they were so conclusive that the police were ordered to shadow the claimant discreetly. He was very cautious, and for several weeks the detectives made no headway. Meanwhile, since the insurance company had refused to pay, an action was begun. Had the case come before a jury, it is probable that the complex scientific methods of the laboratory experts would have failed to convince them, but fortunately one of the detectives discovered that the claimant had stored some bulky cases with a forwarding agent in readiness for shipment to America. And there the painting — which had been secretly packed and removed before the fire — was found.

The methods used by the experts were, of course, much more conclusive in this case, because the Primitives, as the pioneers in Italian art are named, composed their own colours, and each had not only his own jealously guarded manner of mixing his colours, but possessed secrets for obtaining tints which we cannot yet reproduce. These colours not only give distinct and unmistakable results when dissolved and analysed, but have curious fluorescent properties akin to no modern colour. Now that artists usually buy their paints from one of the great firms, chemical tests would not be so definite, but even modern artists have their distinctive tricks for obtaining certain effects, and, although these may be imitated sufficiently well to deceive the eye, the camera, spectrograph, and mercury-vapour lamp cannot be deceived.

Many frauds have been perpetrated by adroit forgers, who have produced wonderfully imitated ancient documents, manuscripts aping the style and handwriting of old philosophers, formulæ of mediæval alchemists, palimpsests, autographed volumes, and even Bibles written in monkish Latin on parchment. The work that these manufactured antiquities involved, if applied to honest labour, would probably have earned for the misguided artisans as much money, and certainly much honour, but the criminal twist in the brain is a strange thing.

Nor are these forgeries always modern. Many are the work of criminals who flourished in past centuries, and the evil they wrought still lives. The laboratories have been called upon to deal with many problems, but none stranger than the case of the fraudulent autographed first editions of the writings of Jean-Jacques Rousseau, Voltaire, and Balzac. A well-known collector had acquired these treasures for half a million francs. He became involved in great financial difficulties a year later, and offered these priceless works to the State library. By a strange chain of circumstances the curator became suspicious of the books, and demanded that they should be submitted to a commission of experts. This was done, but the scientists disagreed. Some declared the works to be authentic; others hesitated, but considered the books to be at least doubtful, because, of all things, there were several noticeable flaws in the type. Now these flaws proved the forger to have been a true artist, for he had at some period had access to authentic volumes in a museum, and the flaws had been characteristic of the true type of the period. He had therefore faithfully reproduced them.

Because of the experts' contradictory reports, the police laboratory experts were then requested to examine the books. Their mode of procedure as usual disregarded the artistic point of view completely. Ink and paper were analysed and found to be modern. The auditoscope, which I have already mentioned, was employed first of all, and gave a totally different whistling note for seventeenth and early eighteenth century ink, and that which had been employed in the manufacture of the forged volumes. Chemical analysis showed the paper to be of different linen from that used formerly, and the ink of the autographs contained traces of aniline colouring. Now aniline dyes were obviously unknown in the days of Rousseau and Voltaire!

A *juge d'instruction* was nominated, and an investigation begun. The volumes had passed through many hands, but at last a most elaborate and complete installation for printing, engraving, and reproducing photographically books as they left the publishers two centuries ago, was discovered in a tumbledown building on the outskirts of Paris. The presiding genius was a man of sixty, who had spent half a lifetime drifting from prison to prison. His organization for ageing the paper and binding was wonderful, and some of the methods used must have taken years to complete. He had amassed a fortune, it is true — how much was never ascertained, for most of it was in banks and property abroad, but in France alone he possessed many houses; yet he never enjoyed his wealth, for his work had become a mania — art for art's sake — and he died before the trial. As I have shown, the composition of the paper and ink in written or printed forgeries are the two great stumbling-blocks to criminals. Since the laboratories have definitely classified all known compositions of paper, ancient and modern, and all inks, whether those used for writing or printing, and even the appearance under the microscope of every known species of pencil, the way of the transgressor is indeed becoming obstructed with thorns, and their name is science.

INDIRECT THEFTS

It is, of course, quite impossible to do more than touch upon the fringe of the offences which to the police are known as 'indirect thefts.' The subject is so vast that it might truly be described as inexhaustible. Moreover, the offences that come under this heading resemble so many kindred methods of making money dishonestly that it is difficult to decide in numerous cases whether they should be truly classified as financial swindles or as confidence tricks. Indeed, these two systems of indirect theft are inextricably involved. Furthermore, as the law stands to-day, it is incredibly difficult for the police to obtain evidence of fraud just at that critical moment when the swindler has slipped over the line which separates lawful from criminal, a line on which the detective stands, tense and watching, but which he may not cross. Most of the successful swindles were evolved and are directed by educated and clever men, who steer their course well within the law; although the police know that the public is being skilfully robbed they cannot easily interfere. Fortunately, the thief sooner or later becomes overconfident and makes a blunder. Then only can the experts act efficiently.

The department which deals with this type of crime is assisted by specialists experienced in financial and company law. It probes discreetly into the past of all those who thrive in crooked ways on human greed for wealth, collects records, photographs, new methods that crop up daily, and classifies every fresh trick, seeking by analogy to discover the loophole through which the detective can thrust a muscular hand to grip the trickster. The schemes invented by the swindler are numerous, their variants countless, but fortunately the basic principles on which they repose are well defined and have changed little during the centuries.

It is perhaps not generally known that most criminal investigation departments have men engaged upon nothing else than a minute scrutiny of all advertisements which appear in the papers. The financial crook *must* advertise if he is to reap a golden harvest. There is his weakness — the heel of Achilles — for if he attracts the attention of the public by his clever, plausible publicity, he also directs the attention of the police experts to his activities.

A strict watch is likewise kept upon the ways along which the money he may receive trickles or flows in streams. The moment an unusual number of postal-orders, money-orders, or cheques are cashed by a firm whose honesty has not been established, the business of the firm or the person to whom they are addressed is investigated, and this in itself frequently leads to his undoing. Swindlers know this, and resort to camouflage. Instead of advertising in the press, they send out circulars. Fortunately, some of these usually go astray and find their way to the watchful department. Also the money is often collected by employees instead of passing through the post, and sometimes master and man quarrel. Another method favoured by crooks is to make postal-orders or cheques payable to numerous dummy firms with alluring titles. Yet nearly always the tentacles thus flung abroad are patiently followed until they converge upon the body of the octopus lurking in a secret retreat provided with convenient exits.

There is a firm in London which for years has carried on a flourishing, lucrative business, carefully maintained within the protective walls of legality. Its victims are always so cleverly chosen that the tricksters have until now evaded well-merited punishment. These victims are either poor inventors who cannot afford to risk a costly legal action, involving solicitors and barristers, or they are firms abroad desperately in need of money, who, when they realize they have been duped, prefer to let the matter drop rather than throw good money after bad. Within the last four years I have handled the evidence submitted by several foreign manufacturers who had lost an average each of eight hundred pounds, but so cleverly was the scheme worked that they decided not to go to law.

This is the method: An inventor, for instance, after many years of weary work, has constructed a model, applied for patents, and now seeks financial assistance in order to float a company or to launch his invention alone. Such a man is always at a disadvantage. He soon discovers that it is easier to build a machine than to sell it. When at last, after many disheartening interviews, he drifts into the net of these apparently kindly people, their ready welcome is like sunshine after rain. They are quite willing, nay, indeed, eager to help him, and express in no measured terms their confidence in the invention and their ability to raise the required capital. Whilst chatting with a member of this firm of 'philanthropists' in a cosy office, several offers of thousands of pounds are dealt with on the telephone. Naturally he hears only what he is meant to hear. But the conversations are apparently carried on with people anxiously waiting to invest. Thus an impressive atmosphere is immediately created. The inventor is then informed that, of course, a small sum will be needed for circulars, advertisements, a search at the patent office in order to make sure that his patents will be granted, and this sum he must advance. Often there is also the company registration fee. The philanthropists undertake, however, to refund this money if they should fail to raise the required capital *through any fault of theirs*.

This appears to be a fair proposal, and the inventor pays, according to his means, which have been adroitly ascertained; sometimes a hundred, sometimes several hundred pounds. Needless to state, after months of waiting and much humbug, it turns out that the capital is indeed available, but cannot be accepted by these honest people because — the reason varies according to circumstances, but long experience has provided this association with countless reasons; always the inventor is to blame, and can neither demand the return of his money nor obtain any redress. *Some* circulars have been printed, number not stated, advertisements put in the papers, a search made at the patent office, and thus the victim has no case. A similar procedure is employed with firms abroad wishing to form an English company. A cleverly worded agreement is entered into, which provides for a penalty at least equal to the sum advanced for expenses, to be paid to the foreign firm should the company not be formed, unless *they* are to blame for this. And they always are. Perhaps a thousand pounds may have been paid to the tricksters, but their attitude is one of pained surprise that it should be mentioned, for have they not lost a handsome commission because of some inaccuracy? The required capital was already in their hands, but in the circumstances they were in honour bound to return it untouched!

A very clever type of fraud, which fortunately is becoming well known, but which is often so cunningly disguised that it is still successfully employed, is the long firm fraud, known to the Continental police as *Carambouillage*, a word as formidable as the men who grow rich by it. Only lately a gang, organized and directed by a Frenchman whose undoubted genius would have brought him riches in any honest undertaking, was rounded up and convicted after a patient investigation lasting nearly a year. This Moriarty in real life succeeded in becoming the leader of a number of crooks who were admitted into the band only if they were possessed of a small sum in cash. With this initial capital he opened several shops under attractive names. These shops soon became popular, for whatever they sold was to be obtained there more cheaply than elsewhere. The wholesale houses were promptly and regularly paid until confidence was established and credit became sound. When this had been achieved, an order for a large quantity of goods was given by one of the shops, and bills payable in sixty days tendered. Long before the two months had expired, everything had apparently been sold at tremendously cut prices, the shop then closed, and manager and employees vanished. Simultaneously with the closing of a business in one district another blossomed forth elsewhere, and most of the goods, removed from the first in small quantities during the last few weeks, would be sold there, adroitly camouflaged, by others of the gang. The ringleader sat in his secret office and directed operations, organizing and deciding which shop should in turn become bankrupt; until at last more than twenty enterprises, that shone brightly for a while, flickered and were extinguished, to be reborn Phœnix-like from their ashes in a distant part of Paris, were controlled by this audacious thief. This went on for so long that complaints poured in from wholesale houses all over France, whilst millions rolled into the coffers of the master criminal.

Success, as usual, made him careless. In order to sell quickly he sold ever more cheaply, until in his shops goods could be obtained for less than the cost of raw material. This attracted the attention of the police, and they noted the various shops, but moved slowly, content to watch and follow, until suddenly, at a preconcerted moment, police-vans disgorged detectives at every one of the emporiums. Soon the cells were crowded with employees of every trade, who had, however, the satisfaction of seeing their managers and the mysterious leader share their lot.

An ingenious type of financial fraud which also belongs to the category of indirect thefts has despoiled many men of their savings, and the police have found it difficult in many instances to obtain the evidence needed to place the offender in the dock. The swindler launches an enterprise which is apparently successful and obviously does not fear investigation. Always it is some undertaking where the employees handle much of the firm's money. Therefore, these men must deposit a certain sum as guarantee. In some instances they receive shares in the business to cover their deposit. Then one fine day they find themselves in sole possession of a concern that has many liabilities and no assets, for upon examination the safe is found to be empty and the account at the bank overdrawn. The director or directors have, of course, disappeared. This swindle was practised on a large scale all over the world just after the Great War, when many ex-service men were anxious to settle down to work once more, and in order to obtain positions were willing to invest a few hundreds, generally their little all.

There was one man in France who bought steam roundabouts cheaply, redecorated them with much gilt and tinsel, and engaged men to run them who could deposit or invest small sums. Although there was an unusual and unnecessary number of employees, they received their wages for a while; then, when the deposits had attained many times the value of the machinery, the owner would vanish, leaving the poor fellows to struggle along as best they might.

In all these cases the swindler was finally caught because he advertised — how else could he find his countless victims? When the investigation of his past activities convinced the police that they were dealing with a criminal, detectives were sent to proffer their money and services, and thus, when, as so often before, the dishonest director slipped away, as he thought unseen, his loot neatly packed in a suitcase, he found one of his employees waiting in the train with gaping handcuffs.

It would be indiscreet to disclose the methods of the police experts in dealing with the *élite* of financial swindlers; their task is quite difficult enough, but I hope I have shown that in the publicity lie the seeds of their downfall.

Perhaps one of the most extraordinary — and even amusing swindles — to those who were not the victims of it — came before the criminal courts of Paris recently. It became known as the 'Pig Farm Fraud,' and no doubt many remember the case. The man who invented it was a briefless barrister, and his plea was that originally he had intended to exploit the idea honestly, but when, to his amazement, twenty-seven million francs swamped his office, the temptation to keep this easily acquired fortune had been overwhelming. I can well believe it! The fellow advertised extensively that for five hundred francs anyone could become the proud owner of a piglet. The animal, selected by the inventor, was to be branded and tattooed on one ear with the owner's initials. It would be tended, fattened, and generally looked after, on what the schemer described as his extensive farms. Thereafter, from a youngster, it would grow into a valuable monster of meat, when it would be sold. The profits, amounting to many thousand francs, would be divided equally, with no deduction but the actual food the pig had eaten.

Somehow, the thought of owning a pig which would grow and grow, appealed to everyone who read the advertisements, the more so since the investor could visit the farm and follow the progress of his duly branded and tattooed investment at any time. No doubt the originality of the whole thing ensured its instant success. To keep a pig by proxy and let Nature do the rest, attracted all kinds of people. Money poured in, until twenty-odd millions had been received. The barrister-farmer spent a large sum and acquired land, huts, and pigs. Several hundreds of pigs! They were marked with brown paint that looked like branding, and the ear adorned with blue and apparently tattooed initials. Several days' notice had to be given when an owner wished to come and visit his property, owing to the overwhelming stress of work. Many came and went their way well satisfied. Their animal was always the fattest, although hundreds of pigs thronged the sties, and it could not be exchanged, for was it not indelibly marked?

And thus for a time the trickster thrived exceedingly. He knew, of course, that a day would come when theoretically the pigs would be ready for the market, and took his precautions accordingly. Unfortunately for him the police had meanwhile made some interesting calculations which exposed the fraud in time, and when the multi-millionaire was ready for flight, he travelled no farther than the prisoner's dock.

I have already mentioned the buried-treasure fraud, which is truly just as much a financial swindle as the sale of worthless shares or salted gold mines. Curiously enough, this buried-treasure trick originated in Spain, and the bait, hidden or unclaimed millions, is still flung abroad from there. Probably the many legends of sunken, gold-filled galleons suggested it.

A typical case was investigated by the great criminologist R. A. Reiss, and he was able to obtain one of the bogus certified cheques which led to the conviction of two members of a clever gang of forgers. The bank was entirely fictitious, and the cheque so beautifully engraved that it deceived many people. Spies of the band travelled extensively and designated those who might become dupes. These were then visited by a specialist who played the part of a loyal old servant. His master, a Spanish nobleman, whom political enemies had caused to be imprisoned, had at the last moment placed all his money in a bank and obtained a certified cheque for it. This cheque the old man had been able to hide when the house was searched. He now wished to cash it, for with part of the money he could buy his master's freedom. In order to cash it, however, the nobleman's signature was necessary. The old man then suggested to the victim, usually a well-to-do provincial not well-versed in Spanish politics, that he should accompany him to the town in Spain where his master was imprisoned. Money would be necessary, of course, to bribe the warders, who would in return obtain the much-needed signature, whereupon they would cash the cheque together and as reward half of the huge sum would belong to the generous confederate for providing the indispensable bribe. The promise of such an unexpected good fortune caused several people to travel to Spain with the servant. They were taken to a large grey building which *looked* like a prison, where they were met by a fellow in uniform purporting to be a warder. To him the unsuspecting dupe handed several thousand *pesetas*, the sum agreed upon as bribe. Servant and warder then entered the building, whilst their victim waited anxiously, fully expecting to see them return with a signed order for the bank. Meanwhile the criminals had slipped out through a side door and were already far away.

CHAPTER IX

THE FEMALE MALEFACTOR — TATTOOING AND THE CRIMINAL — FACIAL CHARACTERISTICS OF CRIMINALS

THE FEMALE CRIMINAL

While it is true that usually women are merely confederates, committing crimes only because they dare not disobey the orders of a gang whose vengeance they fear, or because they follow blindly the instructions of the man they love, there are, nevertheless, many habitual and professional female malefactors. But the offences committed by women are very characteristic of the feminine mentality, and differ much from those of men. They know that in their apparent weakness lies their strength; and guile, deception, and a flaunting of sex are their principal weapons. Rarely does a woman commit robbery with violence; murder except by poisoning is the prerogative of man; and burglary, requiring as it does skilled labour, is beyond her. There have been and always will be exceptions, of course, but the schemes which germinate exclusively in the female criminal brain are sufficiently varied and dangerous to have compelled the police to create special departments where efficient methods for dealing with them have been evolved.

Women distrust their own sex, and when they do choose an accomplice, friendship rather than necessity is the motive for the association. This is in distinct contrast to the ways of the male, who places utility first! Nor do burglars or confidence tricksters seek the help of a woman unless some stronger tie than the mere desire for easily acquired money binds their helpmate to them. They have found to their cost that a woman, however depraved, will always be a slave to her more sensitive nervous system and will allow her likes and dislikes to swamp her reason. Furthermore, the presence of a woman provokes quarrels, and the hatreds and jealousy she loves to beget destroy their unity. Thus, when the experts learn that a woman is implicated in a crime, they at once try to determine by the method used whether she was merely an auxiliary — if so, the perpetrators were men belonging to an organized band and the woman probably the friend of the leader; on the other hand, if the crime is of the type usually committed by female criminals, they know with certainty that she operated alone.

The principle parts assigned to women by criminal associations are those of spy, decoy, and watcher. Of late years many gangs of burglars have made use of young and attractive girls when intending to break into premises patrolled by a night-watchman in order to divert his vigilance. Such a girl is instructed to make the man's acquaintance some days before the expedition and to arrange for a tryst which will keep him from going his rounds whilst they operate. As a variant she may knock at the door and tell a pitiful tale; her parents have driven her from home, or she has lost her job and is penniless. If the weather be cold and wet, all the better. The good-natured watchman, the more easily interested in the poor girl's condition because she is pretty, may allow her to shelter from the inclement weather, perhaps even sharing his food and drink with her. Thus, whilst they are chatting in friendly fashion, he would naturally notice nothing of the grind of drills, the hiss of blowpipe, or the snapping of locks in a distant part of the building. Furthermore, the unfortunate victim of one of these crafty, plausible daughters of Eve rarely dares to relate the truth to the police when the burglary is discovered.

Again, as spies, women can obtain valuable information regarding the habits of employees or inmates of a dwelling, where a man would fail utterly. Adroitly trained by the leader of an association, they learn to make rough sketches of the position of windows and doors; to take impressions of locks, and to note the presence of burglar-alarms and the arrangement of the electric wires and switches. It is hardly necessary to describe the dangerous and subtle activities of women as decoys. In America and Latin countries they are always utilized for this work by footpads and blackmailers. The manner in which these offences are committed immediately reveal if a man or a band directed the woman, who very often did not become a criminal from choice.

The true congenital feminine malefactor, whilst young, prefers all schemes where her powers of seduction give her an undoubted advantage, and her victims are nearly always of the opposite sex. Confidence tricks — which differ essentially from those perpetrated by men — thefts, pocket-picking, blackmailing letters, robbery by means of drugged food or drink, and the shanghai-ing of sailors or civilians in the great seaports more especially attract her.

Female methods are infinitely more subtle than those of the male, and it is this subtlety which betrays them to the expert. It is strange that women, who are in most things more cunning and adaptable than men, should entirely lack the power to visualize the result of their crimes, from the investigator's point of view. They appear to be devoid of imagination, and leave obvious and distinctive traces which reveal their sex to the skilled observer. Their vanity, above all, frequently puts the police on their track. No woman will consent to wear rough men's boots, for instance, in order to avoid leaving narrow foot and small heel marks. Her long nails produce characteristic scratches when searching for valuables; she has a preference for loot which is light, and disdains those objects a man would naturally take.

Her finger-prints are quite different from a man's, and the use of perfumes and powder have more than once led to her undoing. Feminine garments, too, leave their special marks. Moreover, it is well known to the police that fences dislike dealing with women, so they are compelled to sell stolen goods at haphazard, a dangerous thing to do.

For many years the fashionable hotels have been invaded by female thieves who at night enter the rooms of travellers and rob them of money and jewellery. The French reporters invented a clever name for these experts. They described them as 'hotel rats,' for like rats, when all was quiet, they crept from room to room, and often the vague scratchings and rustlings their activities provoked were put down to the ubiquitous rodent. It has become a popular belief that these 'rats' dressed in black silk, which clad them from head to foot like a second skin and covered naked feet and body, whilst a cowl, pierced only for nostrils and eyes, covered the head. This ingenious garment was actually used in several instances. Its advantages are obvious. In a darkened room the nocturnal intruder was almost invisible, the slippery silk made it difficult for the sleepy victim to hold her, and at dead of night such an unexpected apparition produced a numbing shock of superstitious dread, whilst the cowl formed an excellent disguise. But the advantages caused it to be quickly discarded. A woman thus dressed, if seen by an hotel servant, proclaimed her nefarious profession at once, and by its very nature the disguise could not be quickly thrown off. Instead, hotel rats now wear deep-purple pyjamas, because at night the colour has the same qualities as black, whereas the elegance of the dress does not at once advertise their calling. They have copied the methods of Italian *bravi* of the seventeenth century, and instead of a mask or cowl wear their hair so that it can be thrown forward to cover the face; a device once known as the *ciuffa* and much favoured by mediæval hired assassins.

Such a costume is well suited to the needs of the rat. Whilst traversing the corridors a very thin, light-coloured dressing-gown covers the pyjamas. It is so thin that it can be rolled up and slipped into a pocket. If an employee of the hotel should meet a silk-clad lady coming from a room, he would think nothing of it. The principal tool of the rat is the *ouistiti*, slender pliers shaped like curling-tongs, but of finely tempered steel, which will fit any lock, so that the thief can grip the end of the key from outside. Many also carry a species of stethoscope; a sensitive microphone with a rubber cap to cover the keyhole, and provided with an ear-phone or tubes. This instrument magnifies sound to such an extent that the breathing of a person in the room is plainly audible and apprises the thief of the fact that she may operate.

Most hotels now have a bolt on the door as added security for their guests, and several have adapted very complex locks with cylindrical keys. To the expert rat these precautions are no obstacles. It must not be forgotten that during the day the rat is usually a charming, fashionable, reserved woman, who occupies expensive rooms and takes care to arouse no suspicions. In order to obtain a duplicate master key she has many methods. One is to pretend she has come up without her key. She calls the chambermaid to open her door, and expresses ingenuous surprise that one key should fit all the locks. Any pretext will then serve so long as she may handle this key a moment, and a wax impression is the result. She spends much of her time in the lounge and dining-rooms, and watches the guests unobtrusively. She notes the jewels of the women, the appearance of the men, and in a word discovers who are worth robbing and which rooms they are occupying. Then at meal-times when she is sure no one is about, five minutes with a screw-driver suffice to take out the screws which hold the flap of the bolt, to enlarge the holes, fill them with putty, and screw the flap back again. In appearance everything is still normal, but a slight pressure will force the flap from the lintel and the door is open. The advantage of this method is that the flap will be held by the end of the bolt instead of falling. When possible the rat operates by day, but this is dangerous. These hotel thieves are incredibly adroit — at the least change in the victim's breathing they vanish, slip into the light-coloured silk dressing-gown, and walk coolly back to their own rooms.

The moment robberies in hotels are reported to the police, the method used discloses whether a man or woman has been at work. All keys are examined for signs of the grip of the *ouistiti*, the bolt fastenings are tested, and a trap is set. I cannot, unfortunately, relate what shape this trap takes, for hotel thieves are still legion, but it is extremely rare that the offender is not laid by the heels. The very facts that she has been staying in the hotel for some time, is usually alone, and if the news of a police intervention leaks out at once disappears are so many clues. Most of these professionals have been convicted and are known, and each one has her own characteristic touch. Their male friends are watched, since it is they who generally get rid of the loot, and thus within a short time prison walls put an end to their activities for some years.

Curiously enough, women never try their hand at forgery. A man may imitate another man's signature — but never a woman. Confidence tricks and blackmail, however, are their favourite speciality. Only a few weeks ago a charming young lady obtained some beautiful furs, omitting the formality of purchase. They were sent at her request to the hotel where she was staying, for her father's approval. She tried them on, and in the most natural manner opened the door of an adjoining room and called: 'Daddy, daddy, come and look at these furs — see if you like them!' There was no reply. Again she called, more impatiently this time, stepping through the half-open door. Then, with an indignant 'Oh, come along — you need not dress,' she slipped into the room and the door shut. The employee waited a moment, then knocked, and finally tried to follow, but the door was bolted. Meanwhile, furs and lady had disappeared.

A variant of this is to have a friend waiting outside the shop or in another department. She is called insistently to come and give her opinion, thus giving the thief the opportunity of cleverly slipping away. It might lead to much trouble if the shopkeeper were to collar every young and pretty customer the instant she moves away from the counter.

It is difficult to describe the many tricks to which men succumb — for obvious reasons. A very clever system, known as the *juge d'instruction* and much used abroad, shows that some women can combine theft with a sense of humour. Many convictions have made them familiar with the methods of the dreaded investigating magistrate, and the knowledge thus gained is adroitly applied. In some fashion a charming woman will contrive to enter into conversation with the man chosen as her victim, not a difficult matter. A series of apparently innocent questions and a sharp eye soon put her in possession of all there is to be known about him; his business, whether he is married or not, what his wife is like if he is — and, above all, whether he is likely to fear a scandal. When they separate — to meet again — the woman's partner follows him and checks the information thus obtained.

At the next appointment, which may be merely for a chat and a drink, his lady friend knows exactly with whom she is dealing. There are many ways in which she can rob him of money and valuables. Should he discover the theft at once, he is confronted with her intimate knowledge of his affairs and offered the alternative of scandal or silence. Should he leave without having noticed anything wrong, he is again followed by the confederate — also a woman. Perhaps he realizes in the street that he has been robbed, and turns to go to the nearest police station. If so, the partner steps up to him and informs him with a grim smile of the dangers to which he will be exposed by complaining to the police. In nine cases out of ten the man thinks better of it. Should he be exceptionally determined, his money and valuables are returned there and then, on the understanding that he will let the matter drop.

Here again, as in the case of pickpockets, the watching detective is best able to cope with these audacious thieves. He has studied their methods and knows them by sight, or recognizes them from the police charts.

A formidable and insidious form of blackmail is known as the 'clairvoyant's letter.' For days or weeks the inconspicuous female criminal shadows the man chosen, until she has gathered enough details to terrify him. He receives a first letter, in which all his acts of the past few weeks, descriptions of the people he has met, and even fragments of conversation, are faithfully reported. He is warned that his life for many months past is known to the anonymous writer, and unless a certain sum be forthcoming at once, the information will be sent to his wife, family, or employers. The writer's apparently uncanny and intimate knowledge of his affairs comes as a shock; a guilty conscious does the rest. Every person receiving such a missive should seek the help of the police, who know how to act discreetly when dealing with these cases. The blackmailer would be arrested before any harm could be done.

In the schemes evolved by the female criminal the man is always at a disadvantage. The laboratory experts are, however, gradually classifying methods, characteristics, finger-prints, photographs, and especially handwriting, so that the police know at once for whom to seek. It is perhaps little known that those self-styled guides — slinking, furtive creatures who infest the centres of all European capitals — always work in league with female thieves and blackmailers. It is their business to show a stranger the numerous places of amusement, and to ply him with drink, which they inform him he must consume in order to play the game. By devious means, even if he does not wish to do so, glass after glass of wine and spirits is absorbed, in cunningly chosen variation, until he is no longer master of his actions. Then he is led to a café, wineshop, or bar — there are many such — where the last act is played. A powerful narcotic is mixed with his liquor, generally veronal or opium, and he awakes to find himself lying in the gutter in a street he does not know — his pockets empty. Fortunately, the French police have realized the danger of these parasites and have arrested many of them, and Paris is cleaner for it.

TATTOOING AND THE CRIMINAL

Although the denizens of the underworld should be the very last to decorate their bodies with indelible marks, nearly every one of them is tattooed. Professor Lombroso was of the opinion that tattooing, when practised to any extent, is a symptom of degeneracy, or at least a sign of reversion to the primitive, and he is probably right. Lacassagne, the great criminologist, adds: 'The subjects which embellish the skin of a man are an infallible indication to his character, his morals, and his mode of life, and generally betray the profession chosen at the outset of his career.'

This is undoubtedly true. A man is not necessarily a criminal because he is tattooed, but only those in whose blood surges the spirit of adventure, or a latent unrest and dissatisfaction with the monotonous routine of some humdrum profession, submit to the unpleasant and even painful art of the tattooer.

Originally tattooing served many purposes. In tropical lands where the heat makes clothing an irksome burden, it ornamented the nude skin. In the South Seas it was and still is a proof of virile manhood, and in the Marquesas and Samoan Islands a youth is not admitted to the privileges of the hunters and fighters until he has passed victoriously through a long and painful operation, which covers his legs from thigh to knee with a complex design of arabesques. The inflammation this causes is so severe that many die. Those who survive rank henceforth as full-grown men. There are many islands where beautiful figures costing large amounts in shell money or produce are tattooed on the back of a maiden to render her more valuable in the eyes of the young bucks. Many savages disfigure themselves with fearsome designs intended to exaggerate their naturally ferocious appearance in order to intimidate their enemies. Tattoo marks, cuts, and scarification are also much used to indicate the tribe or totem to which a man or woman belongs; and the Arabs mark a married woman on the forehead or between the eyebrows. In the same manner, members of secret societies are branded or tattooed. The sign of the Mafia is a tiny seven-pointed star between the right thumb and index finger. The Camorra used a dot in a crescent, and the notorious Blank Hand the letters M.N. (Mano Nera).

In the world of crime the designs are incredibly fantastic, but they vary with the nationality of the malefactor. The police laboratories know this well and have classified thousands of photographs. It is thus possible to determine the country to which the man belongs, and even his speciality. Confidence tricksters, who rank as the *élite* among criminals and whose female admirers are usually popular courtesans, favour the more artistic compositions and are rarely tattooed on the arms. Pickpockets, because they generally live on the immoral earnings of women, decorate their bodies with mottoes such as 'I love Paulette for life,' 'Faithful to the last,' and the names and crude portraits of their temporary loves. This also applies to the apache or hooligan. Burglars and footpads, because they nearly always began life as locksmiths, mechanics, or carpenters, often carry the tools of their erstwhile profession tattooed on the forearm. The British criminal also favours emblems of a former profession, such as the hammer, anvil, and tongs of the smith; the anchor and ship of the sailor, or the dumb-bells and strong man in tights, of the wandering acrobat. He likes flags, artistic fishes, snakes, dragons, and butterflies; and those who have served as soldiers in the colonies have a penchant for exotic designs. It is rare that the British criminal stoops to the indecent and sexual pictures so much in vogue in France and Spain.

The Parisian apache or the nervi of Marseilles is always tattooed! His favourite themes are sentimental mottoes, insults and threats intended for the police, or pictures of women. He also loves to display a feigned indifference to punishment. There is the case of Dupret, who carried a dotted line on the back of the neck with the sardonic fanfaronade: 'To sever the head, cut along this line.'

Then there are several instances of apaches with a guillotine on their backs and the words: 'Here's where I shall finish.'

Pictures of the penal settlements with convicts in the foreground and a phrase such as 'I shall soon be one of them' are also great favourites.

The most extraordinary tattooing is to be found among the members of the Foreign Legion and those who have served their time in the African battalions. Nothing more grotesque than the designs which cover the entire body of such men can be imagined. Hunting scenes, Arab tortures, Spanish dancers, scenes of carnage, and indescribable outrages surround sentences redolent of whining sentimental self-pity.

'Quick-tempered, but good-natured' was on the back of a callous murderer. A man who killed three of his comrades had 'Born unlucky.' Whether this referred to himself or his victims is not certain. Another favoured 'Defeated, but not cowed.' One fellow had the picture of a foreign legionary bound to the torture stake, and above it 'Souvenir d'Afrique.' The best of all, on the chest of an apache who became an informer, was 'Don't talk, whatever happens.' Spanish criminals are fond of bull-fights, matadors, or dancing women. The designs generally found on the 'Verbrecher' — the German apache — are either military or crudely obscene. Thus, when a criminal is arrested, his true nationality is at once apparent by the pictures on his body, and in most cases it is an excellent record of his past activities.

The question which naturally arises is, Why is the criminal foolish enough to carry such a record indelibly marked on his skin? There are many reasons. Atavistic tendencies no doubt account for numerous cases. Then there is the spirit of emulation and the imitative instinct. He does not like to be less enterprising than his fellows. And the women who frequent criminals like a man to be tattooed. All this proves that Lombroso is right. Tattooing is a sign of reversion to savagery. It is also a sign of mental degeneracy in those cases where it has become a species of mania.

Most of the complex designs are the work of professional artists. There are many shops in London where tattooing is a speciality. I remember seeing one in the Waterloo Road. Every great seaport has such places because the art of decorating the skin is still greatly practised by sailors. In their case it is merely a harmless and picturesque pastime and the natural manifestation of the adventurous spirit which determined their choice of a profession. There is no finer fellow in the world than the British seaman, and his love of tattooing finds expression in designs which cannot be mistaken for those favoured by criminals. The ships, anchors, flags, or wonderful fishes are indications of his love of the sea and his loyalty and patriotism.

The professional tattooer generally uses one or several needles inserted in long handles. He first shaves the part to be tattooed and then either traces the design on the skin or places a sheet of tissue paper with the picture over it and pricks along the lines, taking care not to draw blood. The colouring matter, which is usually Indian ink, vermilion, or powdered charcoal mixed with water, is then rubbed into the traces left by the needle. The skin becomes inflamed and suppurates for a time. A scab forms over the design, which comes away after a week or a fortnight, leaving the tattooing clearly visible, but much enlarged. It does not contract to its definite shape until later. It is not an uncommon thing among the African soldiers and apaches to find men who have contracted a virulent disease because they were tattooed with dirty needles.

I have often been asked if it is possible to efface tattoo marks. They can certainly be rendered almost invisible to the eye, but the camera and the microscope always reveal them, no matter how long since they were bleached. Dr. Variot discovered the only really efficacious method for destroying pigment under the skin; but it is a painful process. The entire design is again pricked with needles; a weak solution of nitrate of silver is rubbed over the surface and tannin applied. The cutaneous secretion coagulates and retains some of the corrosive; a swollen purple weal forms in the place of the blue or red design, and this slowly diminishes until it becomes an almost invisible scar.

Some time ago an Italian claimed to have discovered a liquid which completely bleached any tattoo marks. He became notorious in the criminal world and was much sought after. His preparation was bottled and sold in quantities. The laboratory analysed the stuff and found that it was composed of oxalic acid and carbonate of potassium. The sale was at once prohibited, but not before every hospital in Paris had admitted two or three cases of severe inflammation, localized erysipelas, and blood-poisoning, as the result of foolish attempts to destroy tattooing with this dangerous concoction. Everything has been tried. Nitric acid, sulphuric acid, acetic acid poultices followed by applications of ammonia, and even cauterization with the white-hot blade of a knife. The tattooing may indeed be destroyed, but scars remain which are quite as easily identified as the former designs. Lacassagne observed numerous cases where tattooing suddenly disappeared without apparent cause. This inexplicable phenomenon once became the pivot of a very complex investigation in Berlin.

The body of a man was found lying in a ditch. He had been murdered and the face was so terribly mutilated that identification was well-nigh impossible. It was believed, however, that the victim was a soldier named Sorgman. If this was so, then the assassin was a dangerous drug trafficker known as Schorl. Several friends of Sorgman testified that a fish was tattooed in red on his left forearm. The medical experts had made no mention of any such mark in their report. A specialist was consulted who declared that designs tattooed with vermilion often disappeared after a time, and that it was possible this had happened in the case of Sorgman.

Sorgman had sworn to kill the drug pedlar for having ruined and brought about the death of his sweetheart; thus, if the dead man was indeed Sorgman, his murderer was probably Schorl. The fate of the latter depended, therefore, upon the testimony of the doctor, who had to decide whether the tattooed fish might have faded. No other man had disappeared, and the only reason why numerous friends and relatives hesitated to affirm that the dead man was Sorgman was because no tattooing had been discovered on his arm. A long and patient investigation by the laboratory experts proved that red tattooing did, indeed, become invisible in some cases. The body was exhumed, and the left arm photographed. Faint traces of red pigment were discovered by means of specially prepared plates, and Schorl was thereupon sentenced to death and beheaded. He confessed to the murder at the last minute.

Another peculiar case was that of former soldiers from the African penal settlements, who had deserted and murdered a wealthy Arab sheik. The men were all recaptured and sentenced to varying terms of imprisonment. Some years later, two of them were found dead in Paris, and a piece of skin had been cut from the midst of a network of tattooing on their backs. It was ascertained that these men had stolen a large sum of money from the Arab sheik, which they had buried when they realized that the military police, sent to capture them, were already drawing near. A part of the directions for finding the buried money had been tattooed on each man's neck in cypher. True to his treacherous nature, the leader had killed two of his comrades, and ripped the tattooed directions from their backs, in order to obtain the buried treasure for himself.

FACIAL CHARACTERISTICS OF CRIMINALS

Probably the reader who has patiently perused the numerous types of crime, and the methods the police employ for combating them, will ask: Is it possible to recognize a criminal by certain permanent facial characteristics? Unfortunately, there is no definite rule which can be applied to all malefactors.

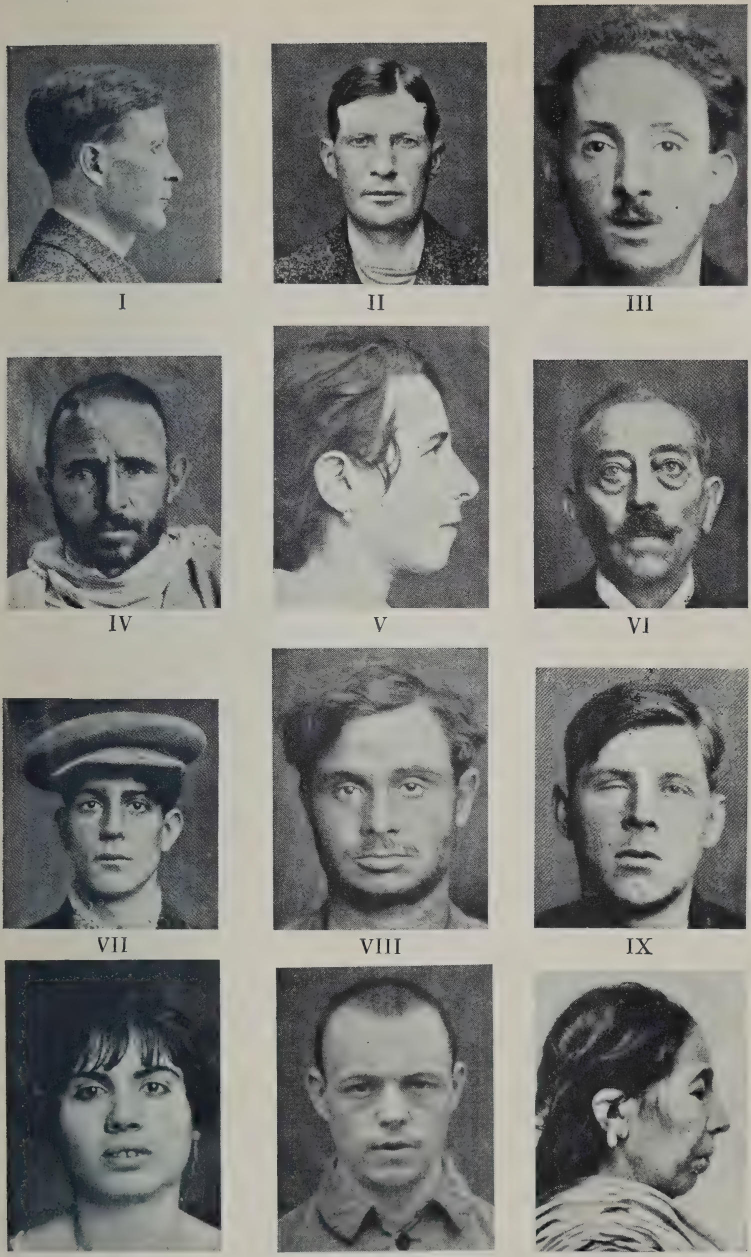
It does not follow, when one speaks of a 'criminal face,' that this must needs be ugly, nor is an ugly face necessarily criminal. Men and women may lack beauty because their features are irregular, badly proportioned, or the colouring wrong, or they may be merely neutral and without character, although each individual feature taken separately can be indicative of outstanding moral and physical qualities. Criminal faces, as the police and the laboratory experts understand them, are divided into three sections: those of degenerates or throw-backs, which vary little during their lifetime; those stamped with the evil characteristics which a career of crime inevitably evolves through constant association with others of the species and a frequent sojourn in penal establishments; and, finally, the faces which reveal the Darwinian deformation and asymmetry of the features which, in many instances, may be merely some single strikingly abnormal development due to hereditary criminal tendencies.

The first species may be generally defined as a reversion to our primitive forbears. Although apparently a paradox, these simian characteristics, due to arrested intra-uterine development, manifest themselves in two distinct forms that at first sight appear to be absolute opposites. One is the microcephalic type. The head is too small, and the brain wanting in those moral and logical qualities which distinguish man from the beast. The eyes usually possess a curious alertness. They are tiny, cunning, and deeply set, with a supraorbital formation that reminds one of the gorilla. The nose is broad, and the loose-lipped mouth hangs partly open, exposing powerful canines. The other has a large, ill-balanced skull, which slopes back to a pronounced deformation of the occiput. The distance between the zygomatic arches is quite abnormal, and the whole head strangely flattened. Such creatures have protruding, glassy, and expressionless eyes, and a wide, almost lipless, mouth. Rey, the terrible Marseilles Landru, was a typical example of this species. He had also the long arms, huge hands, and squat, powerful trunk, which the man of prehistoric days probably possessed, and his feet had a tendency to turn inwards, so that the whole weight of his body rested on the big toes. These men walk with their shoulders hunched and their heads thrust forward. Every action recalls the ungainly and yet supple movements of the ape. Their brutish instincts urge them to commit murders, robberies with violence, or burglaries. In America they become gangsters; in France, apaches or nervi.

All these characteristics are not constantly present, but there is one infallible sign which both always have in common, and that is the striking asymmetry and malformation of the ears. The layman, when he wishes to exercise his powers of observation, is influenced by the popular fallacy that a thin-lipped mouth inevitably denotes cruelty; that the eyes of a criminal must be too widely apart or abnormally close together; that a retreating chin is a sure sign of degeneracy. In reality the worst offenders in the police archives have fleshy lips, medium chins, and eyes set in a normal position.

The one organ, however, which truly reveals primitive instincts is the ear. All our other features are influenced from childhood by the life we lead. Mouth, eyes, and facial muscles constantly play their parts whilst we work or talk. The ear alone remains unchanged, since we have long ago lost the power to move it; and because it is complex in shape, its imperfect formation clearly denotes an arrest or warp in the development of the unborn child, and points to hereditary depravity, abnormal tendencies, and perverted moral and physical instincts. The shape of the ear, taken in conjunction with certain dominant characteristics, is also a guide to racial origin. The visible parts of the human ear are the lobe, concha, helix, anti-helix, tragus and anti-tragus. These should be harmoniously proportioned in the normal human being. In the degenerate they are either undeveloped or quite rudimentary. The ears of the habitual criminal are either lumpy and shapeless, unnaturally flat and broad, pointed at the apex like an animal's, or deficient in lobe and helix. A common characteristic is also a strikingly exaggerated lobe. The photographs of several typical criminals on the opposite page show some of these traits.

Obviously, too, ears can be neither disguised nor altered. Hair and beard may transform the face, the eyebrows can be thinned out, glasses used to hide the eyes, pads added in cheeks and nose. But the ear, since it becomes useless if it is covered, cannot be changed. This Bertillon knew well, and all police photographs are taken so that this organ is strongly illuminated and clearly visible. Formerly, when all women wore long



I II III IV V VI VII VIII IX X XI XII

CRIMINAL TYPES

Figs. I and II. Thoughts and motions hidden behind a mask. — Fig. III. An example of the glassy stare, loose mouth, and asymmetrical eyes. — Figs. IV, V, and VI. Examples of malformed ears. — Fig. VII. A Nervi of Marseilles. — Fig. VIII. Macrocephalic with a malformed mouth. — Fig. IX. The apparently one-eyed man. — Fig. X. A female congenital criminal. — Fig. XI. A French murderer. — Fig. XII. The totally deformed Oriental ear.

hair, it was always cut or pulled away from the ear, so that no detail remained hidden.

Although it is difficult without becoming too technical to describe the characteristics of each nation in full, it has been noted that the average British ear is long, narrow, and fairly close to the head; the lobe is very small, and the helix regular. It is usually set vertically. The Teutonic ear is large, flat, and set obliquely. The Latin ear is small, fleshy, close to the skull, and generally inclined at an angle corresponding to an imaginary line drawn from the point of the chin to the back of the head, with the lobe strongly developed. This is the normal ear. I do not wish to suggest that when the other features are normal and outstanding mental qualities reëstablish the balance, a slight divergence from these fundamental forms inevitably points to criminal tendencies. But where the malformed ear is combined with any of the other attributes of the hereditary criminal, such as, for instance, a loose and shapeless mouth, it usually indicates the potential, if not always the actual, malefactor.

It is evident that these observations cannot be applied to the man who has drifted into the crooked path through circumstances, evil associations, or a gradual loosening of principles. He will have none of the congenital signs, but his features will gradually acquire that strange quality so difficult to define without careful analysis, yet so obvious to the criminologist. Much depends on the speciality he has chosen, and whether he has spent long periods in gaol. Every professional criminal learns to hide his thoughts and emotions behind a mask. (Fig. I and II, page 266.) He quickly becomes accustomed to watch or listen in one direction whilst his attention is seemingly held in another. He appears nonchalant and listless, although every nerve is on the alert, and every muscle tense. If he has been compelled to submit to the iron discipline of English or French prisons, where the silent system is enforced, and convicts are severely punished if they speak to one another, he has also become an adept at modulating the pitch of his voice, so that he can converse without moving lips or facial muscles.

Thus dissimulation quickly develops into a habit. He learns to go at things obliquely, like a cat, and can erupt into violent action as suddenly as a tiger pounces on its prey. After all, this is merely typical of a creature who periodically is either hunted or becomes the hunter. A well-known detective at the Paris Sûreté was able to determine by the reflex action of men loitering outside shops, or at street corners, whether they were criminals or not. He always carried a piece of tin to which a steel spring was attached. When approaching the suspected group he would produce a sudden metallic click in his pocket. By watching their instinctive reaction to the sound, he perceived at once if they were crooks. He was asked once why, when searching for an unknown criminal, he dressed himself in such fashion that he could not fail to be recognized as a member of the detective force.

'Because,' he replied, 'I know a wanted man at once by the studied indifference and wooden expression which he assumes when he sees me. My colleagues, who are close behind, get him whilst he is watching me.'

As the ear is the hallmark of the hereditary criminal, so the mouth reveals the professional crook to the trained observer.

Our lips are shaped by the language we speak. *O*, *r*, *w*, and *l*, the dominant sounds in English, are produced in the throat, and the lips move very little. I know men who can carry on a low-voiced conversation without visibly altering their position. This is a difficult feat for a Frenchman, since there are sounds in his language which can be emitted only by making a funnel of the lips. In Italian it is quite impossible. Therefore, the nationality or the internationality of a criminal can be frequently determined by the shape of his mouth. We have all noticed the flexible mouth, the abnormal upper lip, and strong development of the facial muscles, so apparent in lawyers, public speakers, clerics, and actors. They are the natural result of constant, loud, and emphatic speech. In the same way the snarl, the sneer, and the sounds emitted during moments of stress or acts of violence deform the lips of the malefactor. This is especially so if the man or woman associates with others of his ilk. The solitary forger or swindler will not acquire the evil twist until he goes to prison.

I have already mentioned the glassy, expressionless eyes often met with among criminals. (Fig. III, page 266.) That applies principally to dark eyes, and is therefore less apparent in England. Nevertheless, all criminals acquire the peculiar power of veiling their thoughts behind a blank stare, although many are gifted with the abnormal mobility of the eye, so necessary for quick action.

There is the case of a man who had developed the power to move each eye separately. By dint of long practice he was able to turn them in different directions like a chameleon, and focus the two distinct images clearly. He was a dangerous pickpocket, and his ability to watch in opposite directions simultaneously enabled him to escape the detectives lurking in the crowds which he favoured with his attentions. Several of his victims had reported that a man with a squint —

for so it had appeared to them — stumbled against them just before they discovered that money or valuables had disappeared; but for weeks detectives hunted in vain.

Then quite by chance a man was arrested for suspicious behaviour. He was apparently blind in one eye, and when a doctor lifted the lid he perceived only a red, inflamed eyeball. Although there was no tangible evidence against the fellow, he was photographed and his finger-prints taken. Notwithstanding the doctor's report, the detectives were convinced they had caught the right man, and a trick was tried which proved entirely successful. He was shown a watch, and asked if it was not one which he had stolen. Whilst he examined it a shot and a loud agonized cry came from the opposite side of the room. Instantly the 'blind' eye twisted round in its socket and gazed in the direction of the unexpected commotion. After that there was no help for him, and witness after witness came to headquarters and identified the man with the independent eyes.

The Marseilles laboratories have also made a careful study of the dominant facial characteristics of African and Oriental criminals. As with the European, the ears betray their reversion to an inferior type. An examination of hundreds of photographs of Chinese malefactors, mostly thieves and hatchet men, disclosed the fact that all had abnormally large lobes and a strongly marked temporal development. But it is among the Arabs, Tunisians, and Algerians that the most clearly defined malformation of the ear is to be found. It is a curious fact that this malformation, so prevalent in the male, is rarely, if ever, found in female offenders. This merely confirms the theory that it is truly an indication of reversion to a species allied to man in the pre-civilized state, for, although the female may help the male in any undertaking, she is rarely a congenital criminal. She commits thefts and other minor offences, but does not kill or rob because an irresistible instinct urges her to rebel against law and order. Her rôle was ever to tend the young and wait on her man. He alone was the hunter and fighter.

CHAPTER X

ARSON — THE CRIMINAL PSYCHOLOGY — ARE OUR METHODS OF PUNISHMENT A DETERRENT?

ARSON

Arson, a word as ugly as the crime itself, is not often found in the criminal calendar at the Old Bailey, nor in the list of offences before the Continental courts. The reason is that usually the crime is coupled with the motive which caused an individual to commit arson. It may have been resorted to in order to defraud an insurance company; it may have been conceived as an indirect method of murder, and in the hope of annihilating at the same time that almost indestructible thing, a human body; or as an act of revenge which aimed only at the destruction of property. Not infrequently a criminal calls fire to his assistance to efface the traces of a robbery and now and then it is just the wanton act of a madman. Therefore, in most cases, the indictment is based on the motive, and arson becomes a secondary charge.

Although the public does not often hear of incendiarism with criminal intent, it is nevertheless an offence with which the police experts constantly have to deal, and which requires minute and skilful investigation if the criminal is to be detected. In fact, arson and murder are probably the two crimes which make the assistance of the scientific expert invaluable. Chemical analysis in all its phases, including spectro-analysis and microphotography, are necessary to establish the proof of wilful incendiarism, and when this has become certain the detective applies the principle, 'Who benefits by the deed?' in order to find the guilty person. Many are the methods which have been evolved to set fire to a dwelling or business premises automatically, and many queer devices have been invented which enabled the criminal to concoct an unshakable alibi whilst the flames did their work. Not often do the police find a complete mechanism, although generally they succeed in reconstructing the method employed. Among those discovered by chance the following is a typical instance:

The police of a busy seaport had been warned that the owner of an important business had abruptly increased his insurance, although it had leaked out that he was in great financial difficulties owing to gambling losses. Two detectives were ordered to watch the man's movements. Some weeks passed without any other result than that they learned that he was preparing for a cruise in his handsome seagoing yacht, and had sent a number of invitations to friends. Then one Saturday the watching detectives saw the suspected man enter his premises long after business hours, to emerge some time later in a furtive manner from a back door. He was stopped and questioned, whereupon his very evident confusion and alarm caused the officers to resolve upon immediate action. They compelled the fellow to return with them, and searched the building. In the basement they discovered an alarm clock set for midnight, which had a metal rod soldered to the winding-handle of the alarm spring, and a wooden reel affixed. This bobbin was destined to wind upon it a length of twine attached to a small wedge, against which, accurately balanced, rested a bottle of sulphuric acid. Under it, on a heap of paper and shavings, saturated with paraffin, was a quantity of chlorate of potash and sugar, with a lump of iron — intended to smash the falling bottle — in the centre. As everyone knows, potash and sugar will not only burn fiercely, but also generate intense heat at the touch of sulphuric acid. The device, although crude, would have been terribly efficient none the less, and but for the prompt action of the detectives there is no doubt that at the stroke of midnight, when the incendiary was far away and making merry with the friends who were to testify to his presence on board the yacht, a fire, which would have cost the underwriters many thousands, would have suddenly sprung into life in the silent, untenanted building. Experts were immediately called in, and the finger-prints on the alarm clock and the glass bottle were compared with those of the prisoner. These finger-prints forged the last link in the chain of proof against him.

Another very dangerous expedient was discovered in Paris by the queerest coincidence. One evening a man came running to a suburban police station and informed the officer on duty that a terrible odour of gas was invading his house, and that it appeared to proceed from the premises next to his own. He further related that this house belonged to a wealthy manufacturer, but that it had been untenanted for a week. The police immediately entered the empty house, but were driven back by dense waves of coal-gas. Thereupon they smashed the doors and windows, and waited until the draught had dispersed the poisonous fumes. In a bedroom, lying on the carpet, was the body of a woman, and it was seen at once that she had been strangled. The gas-pipes in every room had been cut, and on a table in the kitchen stood a powerful high-frequency coil. The electrodes had been adjusted to emit a continuous stream of sparks when the hands of a small clock reached a certain hour. At first the experts could not understand why the apparatus had failed to act. A single spark would have sufficed, in an atmosphere saturated with gas, to produce a fearful explosion and the fire, which would naturally have ensued, would have destroyed the building and all traces of the ghastly crime. Upon inquiry they learned that during the hour the hands of the clock passed over the contact on the dial, there had been a breakdown at the local power station, and the electric supply had been temporarily disconnected.

When the manufacturer, who had fled to Italy, was arrested and brought back, this coincidence so impressed him that he confessed to the woman's murder and the consequent attempt to destroy all traces of the crime by fire.

Although these two examples are not illustrative of the scientific methods used by the police, they show how circumstances will sometimes bring about the capture of a criminal. The first step when a fire has destroyed a building is, of course, to determine where the blaze originated and what the cause may have been. Much depends upon the extent of the damage done. Ashes and burnt or charred objects are tested for chemical residues, whose presence would indicate criminal intervention. Had the ingenious device of chlorate of potash and acid proved successful, for instance, chemical analysis of the ashes would have at least revealed the characteristic formation such a mixture produces. It is essential also for the expert investigators to search for incinerated human remains. Furthermore, the electrical recording instruments at the power stations will disclose if an unusually severe short circuit occurred just before the fire was discovered. But it is only fair to state that where a conflagration has entirely destroyed a building, only a close collaboration between the detectives who investigate the lives and records of those who may profit by the fire and the experts whose task it is to discover evidence of arson can lead to the detection of the criminal. Nor must luck — that ally of the law — be forgotten.

No doubt many remember the series of fires in various parts of London which were produced systematically by two professional incendiaries. The men had discovered an inflammable mixture which could be ignited by means of a fuse and would leave no trace. They approached people whose business was not proving successful, and offered, in return for a sum based on the insurance, to set fire to their premises during their absence. Insurance companies were losing heavily; mysterious fires flared up nightly, and nothing could be discovered to prove that these were the work of incendiaries. But, as usual, the criminals became overconfident. The police made inquiries, and learned that these fires were always financially most opportune, and that in every instance they occurred whilst the tenants were away on a week-end holiday. Moreover, the same two men were in every case discovered hovering in the background when the claim for compensation was made.

Once more chance came to the assistance of the police. Detectives observed the suspected men enter a shop in Soho one day, and were about to investigate, when the door flew open and their quarry rushed into the street with blazing clothes. For once their mixture had ignited too soon, with dire results. So great was the agitation of the criminals that the detectives had no difficulty in learning the whole story.

Among instruments used by incendiaries, a metal cylinder filled with a highly inflammable composition proved highly efficient. It was surrounded by paper and shavings, so that these would be ignited by the flames spurting through holes at the top. A cap contained metallic sodium, and fitted tightly over the base. The contrivance was suspended in a large jar connected with a water-tap, which filled it slowly or quickly according to the time which was to elaspe before the fire started. When the water reached the base, it percolated through some tiny holes and ignited the sodium. This in turn set fire to the mixture in the cylinder, and thus to the shavings. The advantage of such a device is that no electrical mechanism nor clockwork is required. The cylinders were of lead, and melted quickly. A specimen, with its cap and adjustable collar for suspension, was seized in the house of an Italian, who confessed to having exploited the idea successfully for a number of years. The curious ring (Fig. I, page 278) was also discovered among the possessions of a criminal, who had used a similar system on many occasions. His method was to fill the interior with alcohol and chemicals, and to suspend it by a string over a lamp. By regulating the flame of the lamp, the ring would explode after a calculated lapse of time and scatter the blazing liquid. The police became suspicious when investigating the origin of several fires, because they always found a curiously corroded formation on metallic surfaces, and spectro-analysis proved that this was due to the action of chemicals which were certainly not on the premises prior to the fire.

F g. II is one of several apparently normal fire extinguishers discovered by the police. These were found to contain spongeous platinum behind a hole such as can be seen at the top, and were filled with an inflammable liquid. A small percentage of ordinary coal-gas in the air would be sufficient to ignite it.

THE CRIMINAL PSYCHOLOGY

The criminal psychology is not so complex as one usually believes. Rarely are greed and its attendant galaxy of brutish instincts the sole motives for those crimes which are classified as the work of habitual malefactors. Vanity and ignorance are the actual basic factors which lead the weak or degenerate to choose the thorny path instead of honest work. Vanity, because he firmly believes that his friends, male and female, admire him for his daring; and also because most newspapers devote entire columns to the description of a murder or a burglary. Ignorance, since the criminal fails utterly to visualize the result of his misdeeds from the victim's, the citizen's, and the investigator's point of view; he always underrates the intelligence of his adversaries, the police, and is firmly convinced that he will never be caught. Furthermore, the criminal has little or no imagination, and is therefore utterly callous.

And he is generally stupid, even though many of his methods may appear at first sight to have sprung from a normal brain. That is because we are apt to confound cunning and guile with intellect, although they have nothing in common. A case which aptly illustrates the criminal mentality is the hold-up and murder which was committed in Marseilles by four Corsicans in November, 1928. A certain bank, not far from the Stock Exchange, received the funds required for the following day at four o'clock every afternoon. This money, wrapped in an inconspicuous parcel, was usually brought in a closed car, almost to the doors of the bank, by two employees, escorted by a burly guard armed with a revolver. During the month of November, owing to repairs in the road, the car was compelled to stop at the rear of the bank, and the men walked the short distance

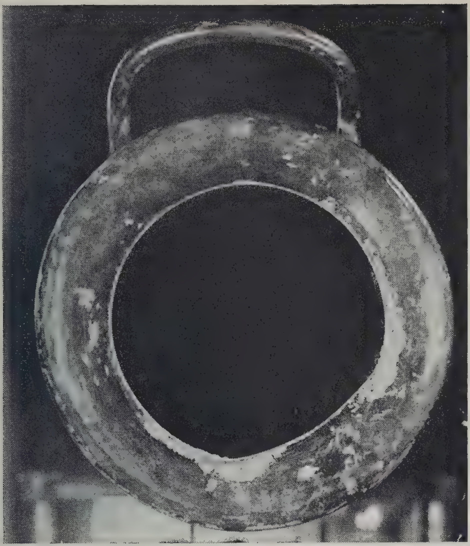
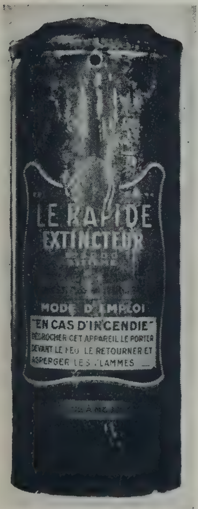


Fig. I. A metal ring containing alcohol and chemicals



LE RAPIDE
EXTINCTEUR
MODE D'EMPLOI
"EN CAS D'INCENDIE"
DÉCROCHER CET APPAREIL LE PORTER DEVANT LE FEU LE RETOURNER ET ASPERGER LES FLAMMES

Fig. II. A fake fire-extinguisher

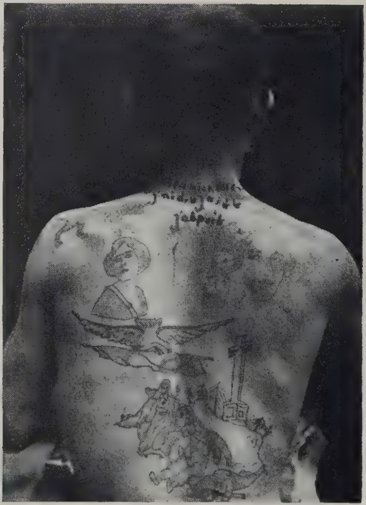


Fig. III. An example of tattooing

INCENDIARIES' DEVICES AND A TATTOOED MAN

to the entrance, closely followed by their guard. This had been noted by a young Corsican, who had also ascertained that every Friday the apparently valueless parcel generally contained half a million francs. He realized that a sudden attack in full daylight, and in a crowded street, would be so utterly unexpected that the men would be helpless for just the few seconds needed to snatch the package of bank-notes. He persuaded three of his countrymen, all youngsters, to join him. One was to sit at the steering-wheel of a fast car, ready to carry them away in the ensuing confusion; the two others, Charlot Mariotti and Griffault, were to point revolvers at the bank messenger, whilst the fourth member of the party made off with the money. Every detail was carefully arranged beforehand, the line of flight decided upon and minutely examined for possible obstacles, and a lonely villa on the coast chosen as a hiding-place for the motor-car.

On the stroke of four the following Friday, two men, their hats pulled low over their faces, abruptly stepped in front of the employees as they were about to cross the street, and, pushing heavy revolvers against their bodies, curtly ordered 'Hands up!' The sight of the weapons and the shock of this unforeseen aggression had the desired effect. The men halted, pale, frightened, and incapable of resistance. But the guard, who did not lack courage, at once jerked his own pistol from his pocket. Before he could fire, however, Griffault, who had seen the glint of the weapon, wheeled and shot the man through the heart. This ruthless murder so terrified the bank clerk who held the money that he turned to run. With a quick jerk the package was pulled from his trembling hands, the three bandits tumbled into the waiting automobile, and before the startled onlookers of this rapid drama could intervene, it was roaring at full speed up the main road leading from the city. No one had recognized the assailants, and had they at once taken ship to Corsica, no doubt they would have escaped. Instead, they drove to the villa, locked the car in a garage, and settled down to divide the spoil.

The next night all four began a round of their favourite taverns, ordering only champagne and expensive liqueurs. The one who had planned the outrage even had the audacity to cry to each new arrival: 'Come along, drink your fill; *there's plenty more money in the bank.*'

A whole night they basked in the glory of unlimited drink and admiration; but already the police were investigating the past of these men, and inquiring into their usual mode of life. None occupied positions which made such wild expenditure possible. Whence had they obtained so much money? The numbers of the stolen notes were circulated, and every bank-note changed by one of the suspected Corsicans was secretly examined. A week later, all four were arrested and confessed.

The whole thing was so typical of a certain type of criminal that I arranged to spend several days in the same cell with Mariotti and Griffault. Needless to say they looked on me as a fellow prisoner, and talked freely. My first question was why had they not left the town at once. Mariotti naïvely related that he had felt certain no one had recognized them, and that, therefore, the police would never discover the culprits. The thought of leaving Marseilles had not entered his head because he had wanted to make a splash: in other words, to dazzle his friends, and to pose before the many women who frequented the taverns as a wealthy and desperate fellow. Neither he nor his companion Griffault appeared to trouble about the punishment in store for them. They fully expected to be sent to Cayenne; but others had escaped from there, and no doubt they would do the same. Mariotti, in fact, spent the days I was in his company composing maudlin Neapolitan and Corsican ditties, and singing them in endless repetition; while his friend sat absorbed in a corner, devouring 'The Count of Monte Cristo,' and taking comfort from the chapter relating that legendary hero's daring escape. Their greatest joy was to relate their exploit to every newcomer to the prison, and they would then smile broadly at his awestruck gaze, and ply him with questions as to what the newspapers were printing about them.

Criminals are primitives. They are creatures whose brain-cells by some freak of heredity are no farther advanced than were those of Neolithic man. They have indeed acquired a veneer of civilization, but it is no more than a thin, fragile sheet, barely concealing the swirling, violent currents of age-old savage desires, that bubble up and swamp their rudimentary reason at the least stress.

IS PUNISHMENT A DETERRENT?

Punishment, as it exists to-day, is no deterrent to crime! A statement which may startle many readers, it is the inevitable conclusion at which I have arrived. Moreover, in striking blindly the knave and the fool, the intellectual whose brain has slipped a cog, and the brute who is merely a throw-back, the law commits the same mistake as do those who would establish equality among all men. Men are not equals, neither mentally, physically, nor morally, and perhaps they never will be. At least not for hundreds of years to come.

What was a lingering death to the poet Oscar Wilde is merely 'a sleep,' in prison slang, to the habitual malefactor. Whereas the one could have been redeemed — the blot on his name was punishment enough — the other would be a constant danger to the community and should be permanently eliminated. There is, moreover, the fearful decision which all of us should face; have we the right to *punish*, or should we only try to protect ourselves against the criminal, as we do against the menace of disease? Punishment, if it does not cure the offender, becomes an act of revenge, and that in itself is a crime. The community should aim at regeneration, but is regeneration possible in our prisons? Those who have truly investigated these cites of stone and iron will emphatically answer — no!

> The vilest deeds, like poison weeds,
> Bloom well in prison air;
> It is only what is *good in man*
> That wastes and withers there.

That is Oscar Wilde's terrible indictment of our methods of repression in his 'Ballad of Reading Gaol,' and it is only too true. What the remedy is, for an error mankind has continued to commit through the ages, it is not for me to say; but if once we admit that the habitual criminal is hereditarily burdened, as with a disease — and the criminal instinct *is* a mental disease — it becomes obvious that the law commits a grievous wrong when it places an individual who has committed an offence only through circumstances, and not because of a warp in his fibre, with the tainted constant offender. It is as though we confined a man suffering from nervous trouble in the same ward with patients smitten with the plague.

THE END

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Although the author was born in London, he spent his early years on the plains of Colorado and Arizona. He later became an assistant of Dr. Bertillon, the criminologist, and has been assigned to investigations all over Europe.

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